



7011B

1100A/B

9900A/AEGIS/B/C/CX/D

Web/SNMP/Modbus

Communications Adapter (CS141)

OWNER'S / TECHNICAL MANUAL

Preface

The CS141 communications adapter is designed to replace the NETCOM, MUCM and LookUPS peripherals for the 7011B, 1100A/B, 9900A/AEGIS/B/C/CX/D, and SUMMIT series of Mitsubishi Electric UPS. It provides SNMP/Web, BACnet IP, Modbus TCP, and Modbus RTU (RS-485) communications.

It can be used to monitor UPS operation and notify of critical events via several means of communication, such as e-mail, web, or SNMP and has the capability for RCCMD remote server shutdown.

For technical support or help configuring the CS141 contact our technical service group.

Phone: 724-778-5111

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1. How to Use This Manual


This manual is written to show you what you can do with the CS141 communications adapter and explains how to configure the device. This manual will guide you step by step through all menus and explain nearly everything you need to know to ensure proper monitoring of the UPS system.

This manual uses notice icons to draw attention to the user important information regarding the safe operation and installation of the CS141 communications adapter. The notice icons used in this manual are explained below, and should be taken into account and adhered to whenever they appear in the text of this manual.


1.1 Caution for Wirings

Caution 	<ul style="list-style-type: none">Wiring, maintenance and installation should be performed by a professional and qualified service technician. Defects on wiring can result in electric shock, fire, and/or fault in product.
---	---


1.2 Caution for Use

Caution 	<ul style="list-style-type: none">Do NOT touch, repair, or retrofit the CS141 adapter. Failure to follow this warning may result in electrical shock.
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1.3 Caution for Maintenance

Caution 	<ul style="list-style-type: none">Only Mitsubishi Electric Power Products, Inc. qualified service technicians should perform maintenance on the CS141 adapter.
---	--

1.4 Caution for Qualified Service Personnel

Caution 	<ul style="list-style-type: none">Maintenance on the CS141 adapter should only be performed after fully understanding the contents of this technical manual. Improper procedure can result in electric shock, fire, and/or fault in product.Do NOT touch CS141 with wet hands. This increases risk of electrical shock.
---	--

1.5 Caution for Operation

<p>Caution</p> 	<ul style="list-style-type: none">• Operation of the CS141 adapter should only be performed after fully understanding the contents of this technical manual.• A fault in other connected equipment is not covered under warranty, even if caused by a fault from the CS141 adapter.
<p>Caution</p> 	<ul style="list-style-type: none">• In the case of a fault in the CS141 adapter, contact a Mitsubishi Electric Power Products, Inc qualified service technician. Provide the service technician with a detailed description of the fault.

2. Overview

2.1 Contents on Delivery

The below part numbers come with the CS141 communications adapter and the required hardware for installation.

UA-100544

UA-100847

UA-100554

UD-101118

UD-101120

Note: The above part numbers must be installed by a Mitsubishi Electric Power Products, Inc. qualified service technician.

Part number UA-100820 for installation on the Mitsubishi Electric 7011B Uninterruptible Power Supply comes with the below:

- CS141 communication device
- External power supply
- RS232 serial cable for connection to the UPS

2.2 Function Overview

In SNMP mode, the CS141 adapter works with a preinstalled Simple Network Management Protocol (SNMP) software agent.

This agent exchanges status data with the UPS via so-called "get / set" commands and forwards them in the form of "trap messages" to predetermined recipients. These "trap messages" are used to alert necessary persons during or before critical situations happen within the UPS. In addition, the SNMP adapter can send RCCMD signals (Remote Control Commands):

For clients with the RCCMD software installed, functions can be programmed to trigger commands based on configurable commands.

Administrators can run simple system shutdowns as well as a highly complex shutdown and restart routines.

2.2.1 SNMP Trap Functionality

The task of the SNMP adapter is to communicate the alarm states of the UPS to a monitoring station (traps) and to provide UPS data and information.

Additionally, the CS141 provides functions for simulating and testing trap messages during the configuration procedure.

2.2.2 RCCMD Support

The CS141 is a full manager and not just an SNMP-Card, the network shutdown routines can be configured to react as fast as possible.

Thanks to integrated RCCMD support, the CS141 offers a flexible and fast way to operate even the most complex shutdown solutions. By using standardized network technologies and protocols, the patented RCCMD server sends control commands to the clients in real time.

2.2.3 Real Time Log Files

The CS141 provides a compilation of log files to provide a complete timeline in the case of critical incidents.

This log file is accessible via UNMS, UPSMAN, WebGUI and FTP or can be sent via mail to configured e-mail accounts.

2.2.4 Advanced Mailing Capabilities

The CS141 provides the capabilities to connect to any mail server using standardized encryption technologies.

2.2.5 Web Server

The unique built-in web server of the CS141 displays all information about the UPS system. The built-in web server of the CS141 can also be used to display a graphical representation of essential UPS data; i.e. input voltage, output voltage, current, etc.

The preferred web browser to access the web interface is Google Chrome. Other web interfaces may not be as stable.

2.2.6 Modbus

Modbus is the standard protocol used in industrial applications for monitoring and building management.

The CS141 provides a standard Modbus over IP interface. In addition, the CS141 comes with a terminal block connector to provide a connection for Modbus over RS485.

2.2.7 SNMP

The CS141 communicates using SNMP via the UPS standard MIB RFC 1628.

3. Initial Configuration

3.1 Network Integration




Configuration of the CS141 is performed exclusively through the built in Web interface.

In order to facilitate the initial configuration or perform on-site trouble shooting, the CS141 communications adapter is preset to the hard coded IP address 10.10.10.10



In factory default setting (the slide switch is in the center position) the CS141 is in configuration mode.

The following table lists regular operating modes:

<p>Slide switch center position:</p> <p>Enables configuration mode. After reboot the hard-coded IP address 10.10.10.10 is active.</p>	
<p>Slide switch to the right:</p> <p>Automatic IP addressing: DHCP is activated and an IP address is set automatically. Check the MAC address of your CS141 to identify the IP address in the DHCP server table.</p>	
<p>Slide switch to the left:</p> <p>Use of the IP address values manually configured. If DHCP is used, the IP address needs to be blocked for single usage.</p>	

3.2 Preparing the CS141

Prior to powering up the CS141, ensure the slide switch on the front is set to center position. After start up, the CS141 will be in configuration mode with the IP address set to 10.10.10.10.

Note: Changing the mode via the slide switch requires a reboot of the CS141. You can perform the restart in two ways:

- 1) Removing the power supply (hardware reset)
- 2) Using the Reboot feature found inside the Tools menu (software reset)

This operation does not affect the UPS connected to the CS 141

3.3 Preparing the Workstation

After start up, the CS141 Web interface can be found using the following network address:

IP address 10.10.10.10

Subnet Mask: 255.255.255.0

Depending on the type of connection you choose, the service computer can be connected directly to a crossover cable or via the local network.

The following are the recommended network settings for the service computer:

IP address 10.10.10.11

Subnet mask of 255.255.255.0

Gateway 10.10.10.11

DNS: none

To determine if the service computer is able to connect to the CS141, test the connection by “pinging” the CA141. Open command prompt and type “ping 10.10.10.10”.

```
H:\>ping 10.10.10.10

Pinging 10.10.10.10 with 32 bytes of data:
Reply from 10.10.10.10: bytes=32 time=30ms TTL=64
Reply from 10.10.10.10: bytes=32 time=1ms TTL=64
Reply from 10.10.10.10: bytes=32 time=1ms TTL=64
Reply from 10.10.10.10: bytes=32 time=1ms TTL=64

Ping statistics for 10.10.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 30ms, Average = 8ms

H:\>_
```

If the settings are correct, the CS141 will respond accordingly.

As soon as the connection to the CS141 is established open your web browser and type in <http://10.10.10.10> as the web address.

3.3.1 Using DHCP

To avoid a network conflict, activate the DHCP mode for automatic IP address assigning:

Slide the slide switch to the right; to the outer edge of the CS141. Reboot the CS141 and it will now boot in DHCP mode according to the hardware configuration and obtain an IP address from your network.

3.3.2 Required Information for Locating the CS141 in DHCP Mode

To identify the devices, please note the MAC address including location data before the hardware installation.

The MAC address can be found as a unique sticker on the bottom of the communications adapter:



Ensure a suitable DHCP server is available for this operating mode, otherwise the CS141 will not be able to get valid IP address data automatically.

Once you have identified the MAC address of the CS141 use a suitable piece of software that will allow you to scan for devices connected to the network. Identify the CS141 by the MAC address and note the corresponding IP address assigned to the CS141. You will now use this IP address to access the Web Manager for configuration by typing it into your web browser.

3.4 Required Ports

For optimal functionality, the CS141 requires a various number of ports to be open or available. Some ports are standard ports within your computer, others need to be opened in order to use all functions. Please check on-site whether the following ports are available for use:

Echo	7/tcp
echo	7/udp
WOL	9/udp
ftp-data	20/tcp
ftp	21/tcp
telnet	23/tcp
smtp	25/tcp
http	80/tcp
snmp	161/udp
snmptrap	162/udp
time (rfc868)	37/tcp
time (sntp)	123/tcp
rccmd	6003
Upsmon	5769
Modbus over IP	502/tcp

3.5 Modes of Operation

The CS141 can only be configured using the built in web interface and has four valid operating modes.

When selecting the operating mode, the function of the CS141 within the network should be considered:

If the CS141 runs as an active element within shutdown solutions or in conjunction with higher level monitoring structures, a manually assigned IP address makes the most sense.

As another advantage the CS141 starts faster with a preconfigured static IP address.

3.5.1 Configuration Mode

Configuration mode is the default preset on delivery:



The slide switch is in center position. The web manager can be reached via the preset IP address 10.10.10.10 and allows all system-relevant settings to be modified. Since the CS141 generally uses the preset IP address in configuration mode, this mode allows importing backup data and allows for adjustments until restart without harming the network.

3.5.2 Operating Mode

Depending on the setting, the slide switch will be set to left or right position and puts the CS141 into one of two operating modes.



In manual mode (slide switch to the left), the device uses a static IP address, enter the correct IP address. Please note that incorrect settings may cause address conflicts on the network. The data required for manual mode can be obtained from local system administrators.

Note: In manual mode, the data is entered by technicians and thus permanently assigned. The CS141 will use the assigned IP address to access the network. Assigning an address twice will cause a network conflict. In this case, switching back to configuration mode will allow the CS141 to be reached at the default IP address of 10.10.10.10.



In DHCP mode (slide switch to the right), the CS141 automatically inherits settings assigned by a server and uses them for the IP address settings. The web server takes over the administration of the IP address data.

Note: As a rule, DHCP-assigned IP addresses via automatic mode are reserved for specific time. DHCP clients therefore ask after 50% of this time window whether the IP address is still valid or will be assigned to another client. How statically the DHCP server allocates IP addresses is a decision the system administrators make. Due to this fact another IP address can be re-assigned after rebooting or a CS141 appears to be lost during regular operation.

3.5.3 Rescue Mode

In this mode an additional jumper is set and the slide switch is set to the center position.

The CS141 can access two ROMs for booting. Therefore, this failsafe design is able to contain the current firmware as well as the last state before the firmware update including the configuration file.

When the CS141 is set to rescue mode it starts from the last known state and is initially fully operational again but indicates in the general system information that the web manager is in rescue mode.

4. Basic Settings

Most settings can be done as long as the CS141 is in the configuration mode. Depending on your network settings there could be a problem when performing tests and forwarding functions. They are often not possible on hardware preset 10.10.10.10. Due to this fact it is a good choice to configure all basic settings inside configuration mode and switch to normal mode before starting advanced UPS configuration.

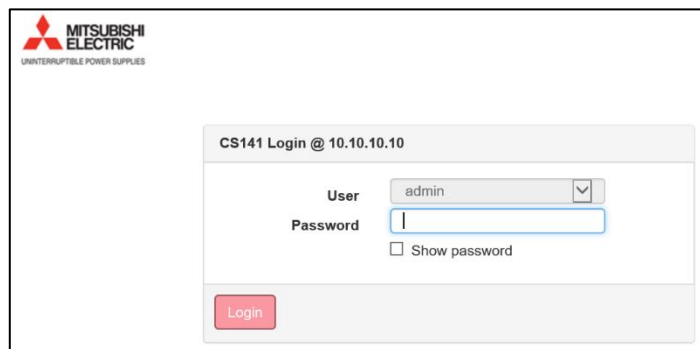
4.1 Users and Passwords

After you enter the IP address, the CS141 responds with its web interface and prompts the user to change the admin password. This password will be required for all admin access to the device.

There are three users with different system rights to choose from. The users are predefined, the passwords can be freely defined:

User: admin	Password: TBD by user	... System administrator, complete menu tree accessible
User: engineer	Password: engineer	... Technician, administrative restricted system access
User: guest	Password: guest	... guest account, only status indicators visible

To start initial configuration, log in with user admin and the password setup at start-up. When logging in for the first time the user will be prompted to use the setup wizard to setup the CS141 adapter. Follow the instructions for the setup wizard.

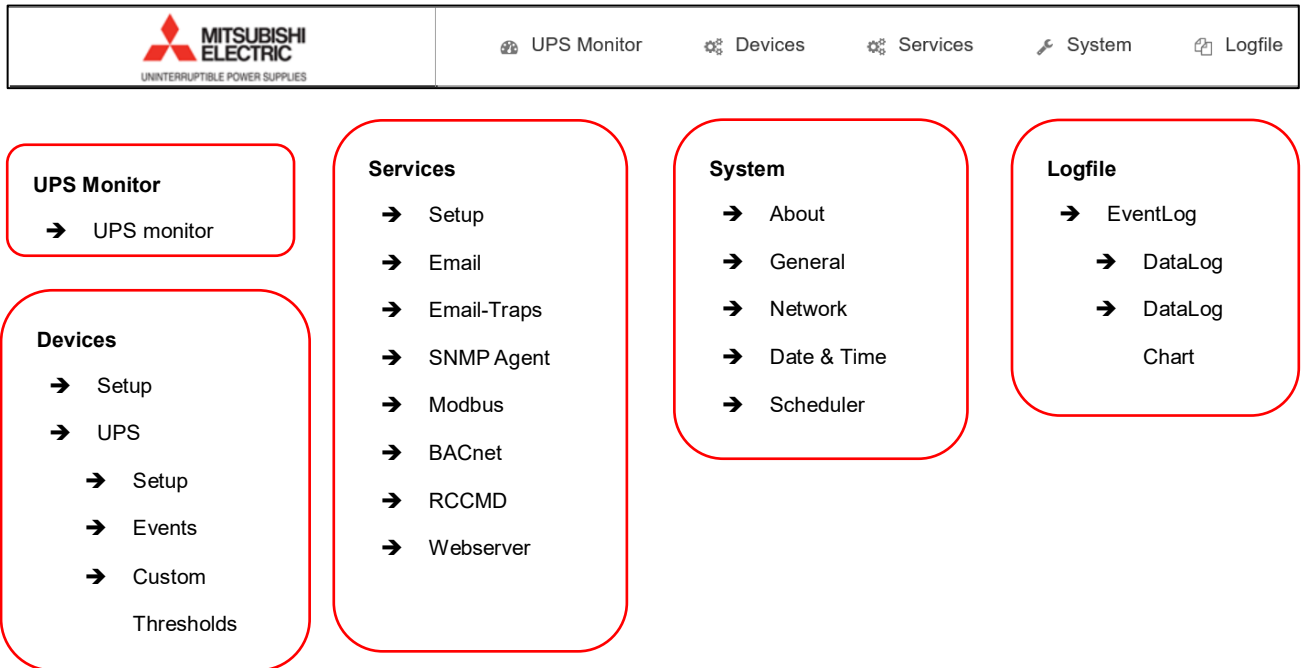


Note: Modern web browsers are designed to display websites as fast as possible. Among other things, special techniques are used to pre-load images, pages and query masks are loaded into a buffer for a faster review. In some cases, this web browser behavior may result in screen errors.

If these phenomena occur, update the browser by pressing CTRL + F5 or clear the cache of the web browser and deactivate additionally installed tools and addons, which could obstruct the presentation.

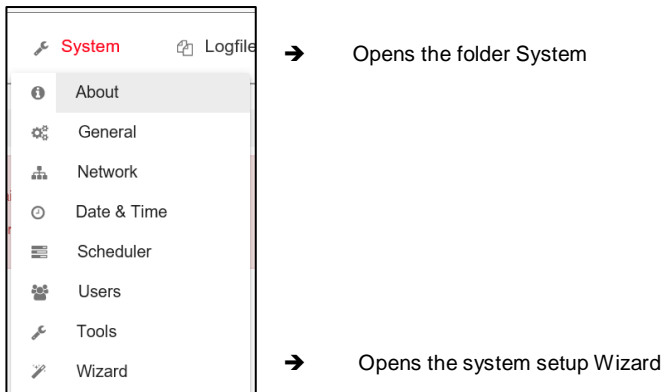
4.2 Configuration Menu Overview

This is the menu tree showing all basic functions the CS141 provides:

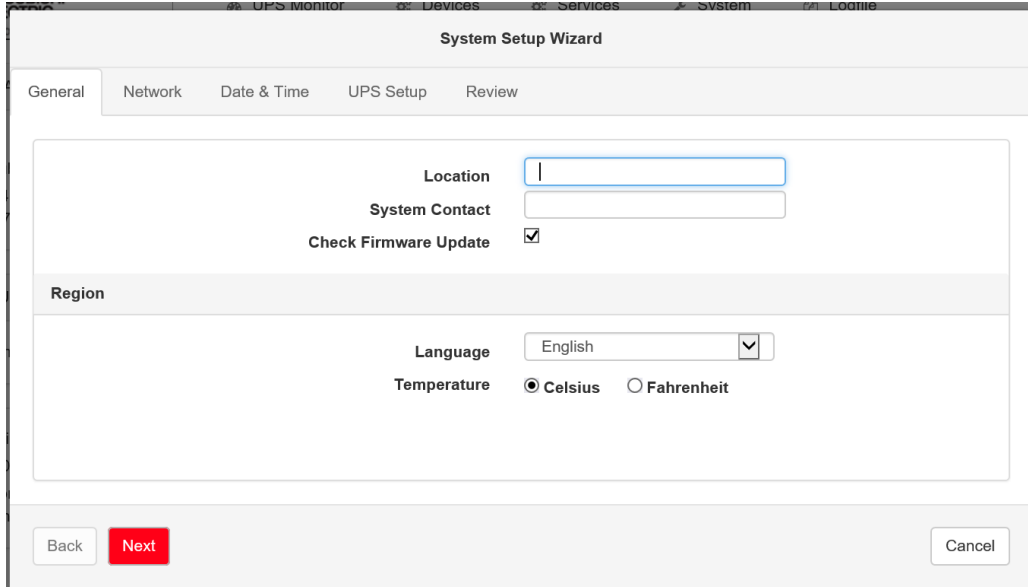


4.3 Setup Wizard

For this configuration step, navigate to the following menu (except on first log in):



When you use the CS141 for the first time the welcome screen will automatically start with the wizard. Please note that you cannot switch through the tabs directly, you need to follow by pressing next.



The Setup Wizard helps to set up the basic CS141 configuration and has the following tabs.

General:

Basic information about the location to be installed, system language and temperature scale.

Network:

Enter the network configuration - The necessary data can be obtained from the local administrator.

Date & Time:

Provide basic information about the date, time, and time server.

UPS Setup:

Enter information about the UPS the CS141 will be connected to.

Review:

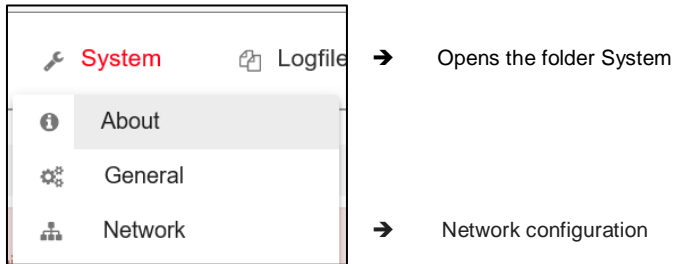
Check data before you finish the configuration process.

Note: The Setup Wizard simply summarizes basic settings and provides a quick and convenient solution that can be used to make or change basic settings. If you want to perform the configuration completely manually, click Cancel - You can always restart the Setup Wizard in the configuration menu.

Be careful: Some entries such as UPS configuration have dependencies to advanced configuration entries the Wizard does not include.

4.4 Network Settings

Network settings are accessed by navigating to the following menu.



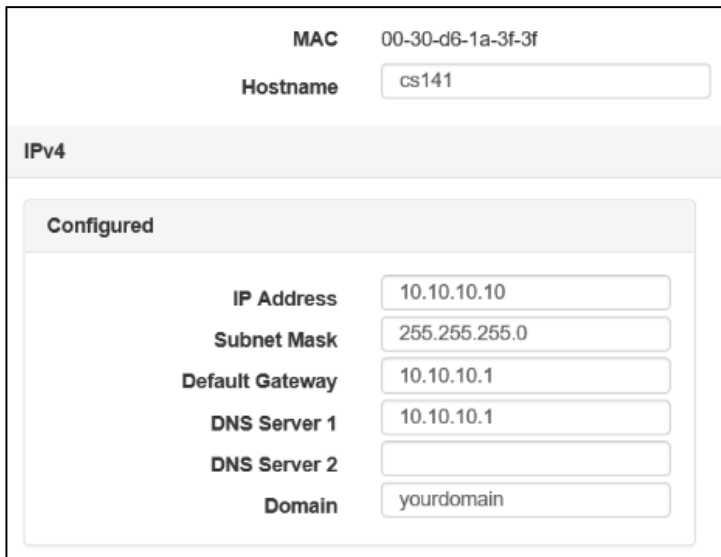
Once selected you will see the following screen.



Configured		Active	
IP Address	10.10.10.10	IP Address	10.10.10.10
Subnet Mask	255.255.255.0	Subnet Mask	255.255.255.0
Default Gateway	10.10.10.1	Default Gateway	0.0.0.0
DNS Server 1	10.10.10.1	DNS Server 1	0.0.0.0
DNS Server 2		DNS Server 2	0.0.0.0
Domain	yourdomain	Domain	yourdomain

Under Configured, enter the IP address data the system will use. Active shows the current IP address settings used by the system.

It is possible to change the following settings



MAC 00-30-d6-1a-3f-3f

Hostname cs141 → Hostname

IPv4

Configured

IP Address 10.10.10.10 → IP Address

Subnet Mask 255.255.255.0 → Subnet Mask

Default Gateway 10.10.10.1 → Default Gateway

DNS Server 1 10.10.10.1 → DNS Server 1

DNS Server 2 → DNS Server 2

Domain yourdomain → Domain Name

Press Apply to save your settings.

Note: At this point, the web browser redirects you to the new IP address. Since the CS141 is still in configuration mode, you will receive an error message from your web browser. In this case, ensure to work with the IP 10.10.10.10 and press CTRL F5 to refresh the web browser.

For a first configuration, the network settings are the only settings you currently need to make in Configuration mode.

It is possible to carry out all other settings in regular operating mode.

4.4.1 DHCP Mode During Initial Configuration

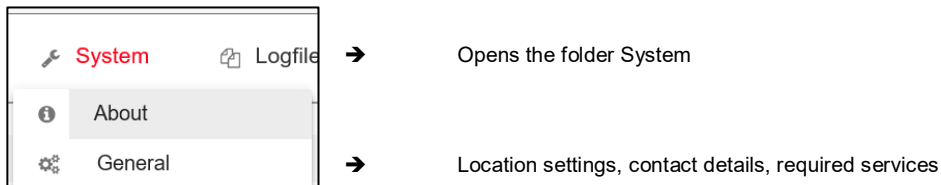
While booting in DHCP mode, the server assigns an IP address to the CS141. This IP address can be found by using suitable network scanning software and locating the device by using the MAC address that is attached to the CS141 adapter.

After login, it is possible to access network settings and change the IP address; after rebooting the device in manual mode the IP address setting is active. By switching back to DHCP mode the CS141 falls back to server-assigned address.

The advantage of this setting is that many CS141 units can be placed on the network at the same time without much effort, which are immediately accessible without the possibility of an address conflict. The disadvantage is that in DHCP mode the IP addresses can change dynamically, which means that higher-level or docked shutdown solutions may no longer be able to access or output errors.

4.5 Location Settings

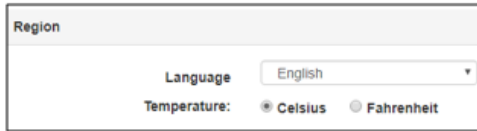
Network settings are accessed by navigating to the following menu.



Once selected you will be see the following screens.

Location data can be read by any software supporting this feature. If used in larger installations with many devices, location data will help to associate installed devices and their locations in a facility.

Location	<input type="text"/>	→	Enter the physical location of the device
System Contact	<input type="text"/>	→	Enter the responsible staff or department to be contacted
Customer Signature	<input type="text"/>		
Check Firmware Update	<input checked="" type="checkbox"/>	→	If checked, the CS141 reports firmware updates



- ➔ Select the language for configuration menus
- ➔ Select temperature measurement scale

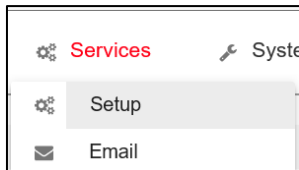
Under Language, select your preferred system language. Supported languages are German, English, Chinese (Simple), French, Spanish, Polish, Portuguese

Under Temperatures, select the unit of measure in which to display the temperatures.

Note: The CS141 recalculates the values when rescaling and adjusts the settings automatically - but a higher level system configured to Fahrenheit will inevitably receive incorrect information from a CS141 set to Celsius.

4.6 Provided Services

Provided services settings are accessed by navigating to the following menu.



- ➔ Opens the folder Services
- ➔ Basic settings, services configuration

The CS141 uses separate system services for communication, which can be started and stopped independently to each other:

This allows activating and deactivating the functions without having to restart the CS141 completely.

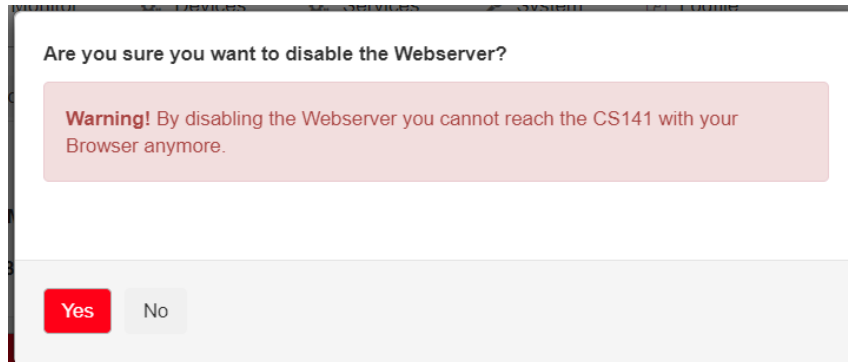
While Modbus and SNMP are used as the industry standard inside almost all higher-level monitoring systems, the UNMS server is only necessary if you use the monitoring software UNMS 2 from Genorex.



To enable or disable the according service, use the buttons. Switch to the right means the service is enabled, switch to the left means the service is disabled.

4.6.1 Webserver

Disabling HTTP will restart the device without starting the web interface. By disabling, no further configuration is possible. The CS141 therefore issues a direct alert before disabling this option. Ensure your configuration is done perfectly - Disabling the HTTP Server cannot be undone without physical access to the device.



Why it is possible to deactivate this server?

In some cases, it is necessary to reduce possible interactions with the device and to increase security.

Depending on its configuration only additional sftp-access is possible in order to download data logs. Therefore, the admin password can be known without consequences to network security.

Note: The rescue system on the CS141 has not only saved the last firmware, but also the last configuration before your update. If you intend to deactivate the http functionality, it is recommended to perform a firmware update before this last configuration step. By doing this you will be able to access the system by its build-in rescue mode.

4.6.2 SNMP

The Simple Network Management Protocol (SNMP) is a network protocol developed by the IETF to monitor and control network elements from a central station.

The protocol controls the communication between the monitored devices and the monitoring station. Thereby SNMP describes the structure of the data packets that can be sent as well as the entire communication process.

It was designed to ensure any network-capable device can be implemented into monitoring systems.

Possible tasks of network management using SNMP include:

- monitoring of network components,
- Remote control and remote configuration of network components
- Error detection and error notification.

With its simplicity, modularity and versatility, SNMP has become the standard supported by most management programs as well as endpoints.

If you want to use SNMP in your network, leave the check mark active for this function.

4.6.3 Modbus

Fieldbuses are bus systems that connect field devices like sensors or actuators inside a complex operating scenario to allow communication to an according full-automated managing system.

If several communication partners send their information over the same line, it is necessary to ensure communication about fixed rules:

- who (identifier)
- what (measure, command) and
- when (initiative)

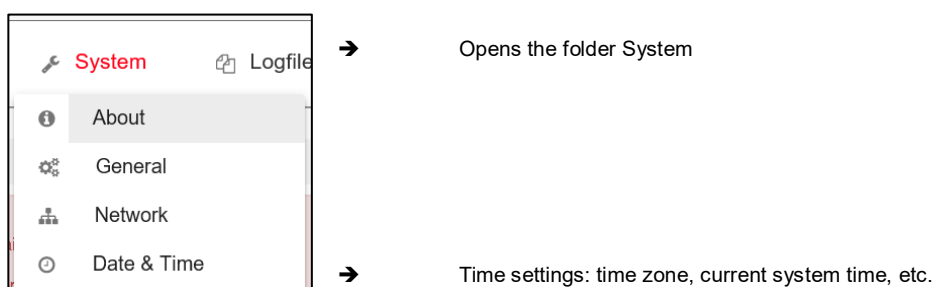
To ensure this communication, there are standardized protocols to be used.

4.6.4 UNMS

The UNMS server was specially developed to communicate with the universal network management software from GENEREX. The successor, UNMS 2, communicates via UPSTCP on port 5769. The UPS server service enables or disables availability through this port.

4.7 Date and Time

Date and time settings are accessed by navigating to the following menu.



Some system critical activities like logging or running recurring tasks require a reliable real-time clock.

For this reason, the CS141 provides its own system clock but also offers the ability to query external NTP servers.

4.7.1 Automatic Time Adjustment

Current system time	01/16/2018, 03:39 PM		
Timeserver Address 1	<input type="text" value="4.128.168.10"/>	<input type="button" value="SNTP"/>	<input type="button" value="Test"/>
Timeserver Address 2	<input type="text" value="1.pool.ntp.org"/>	<input type="button" value="SNTP"/>	<input type="button" value="Test"/>
Timeserver Address 3	<input type="text"/>	<input type="button" value="SNTP"/>	<input type="button" value="Test"/>
Timezone	<input type="text" value="(UTC+01:00, DST) Amsterdam, Berlin"/>		
	<input type="button" value="Synchronize CS141 with Timeserver"/>		
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>			

- ➔ Current system time
- ➔ The first time server
- ➔ The second time server
- ➔ The third time server
- ➔ Choose the time zone
- ➔ Starts the time synch procedure
- ➔ Save entries / abort configuration

If the network settings are set correctly and the CS141 gets an internet connection, you can use the default server settings. In case of a local time server inside a closed network segment, the CS141 provides the ability to use an IP address instead of a name. If internal time services are used, we recommend the option to enter an IP address although a DNS-Service is available:

If DNS lookup fails, the NTP synchronization will not run

Pressing Apply will save the settings and restarts the time server service inside the CS141 without rebooting.

As soon as the time service accepts the new settings the first time synchronization will follow.

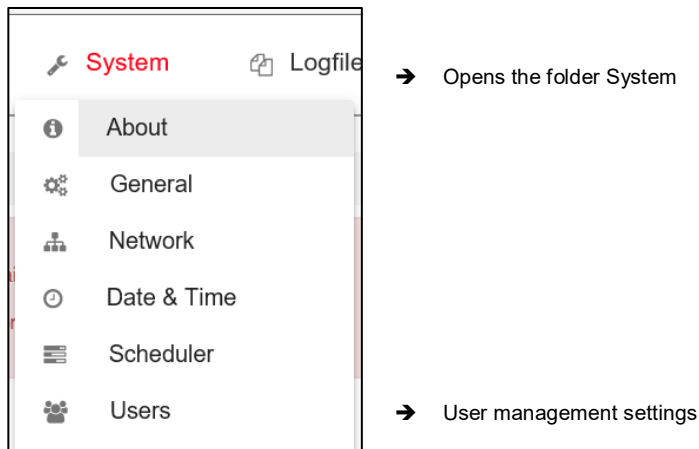
Note: A time server normally provides preformatted time containing information about used time zones.

The CS141 calculates the real system time itself from the time zone setting.

If you operate your own time server, this time zone must be adjusted accordingly.

4.8 User Management

Date and time settings are accessed by navigating to the following menu.



The CS141 provides a preset for 3 user profiles to assign different system privileges:

Settings that do not correspond to the corresponding user profile are hidden as soon as the corresponding user logs on. The user names as well as the privileges assigned to the users are hard coded by the CS141. Administrators are only allowed to change passwords:

The administrator

User: admin
 Default-password: Configured by user at the first start-up in configuration mode

Due to its function, the administrator gets the full range of configuration options. The administrator manages network and mail settings. Furthermore, the administrator is the only user with permission to change the landscape of connected devices.

The technician

User: engineer
 Default password: engineer

The technician's user account is restricted to technician necessary functions. They may access the functions that relate to the technical operation of the system. They have the ability to customize and configure available devices and perform the necessary adjustments.

The customer

User: customer
 Default password: customer

The customer has access to use the system monitors and also view as well as download a collection of log files, deleting log files is not possible.

Guest access

User: guest
 Default Password: guest

The guest has access to view system monitors without triggering additional functions. Due to this fact, a special feature comes with this user: If necessary, the administrator can disable password requirements for guests.

Guest		
Disable User	<input type="checkbox"/>	→ Enable/disable password query
Anonymous Access	<input type="checkbox"/>	→ Enter a new password
New Password	→ Verify password
Verify Password	

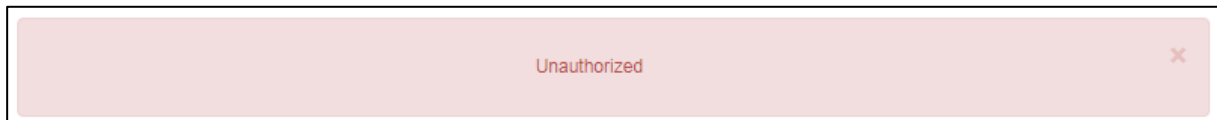
To use guest access without the password requirement set the mark for Anonymous Access otherwise the CS141 will ask for a valid password

Note: Only the admin is allowed to manage COM interfaces. This is necessary due to the fact that attached monitoring systems may need to be prepared for a change inside the hardware landscape before local hardware or components can be disabled for local maintenance duties.

If a technician already "starts" before administrators stop according monitoring services erroneous alarm states may occur.

4.8.1 How to use Guest/Anonymous Login

Normally, the CS141 only provides information via its web interface if a user successfully logs in. If user is not authorized the following message will appear.

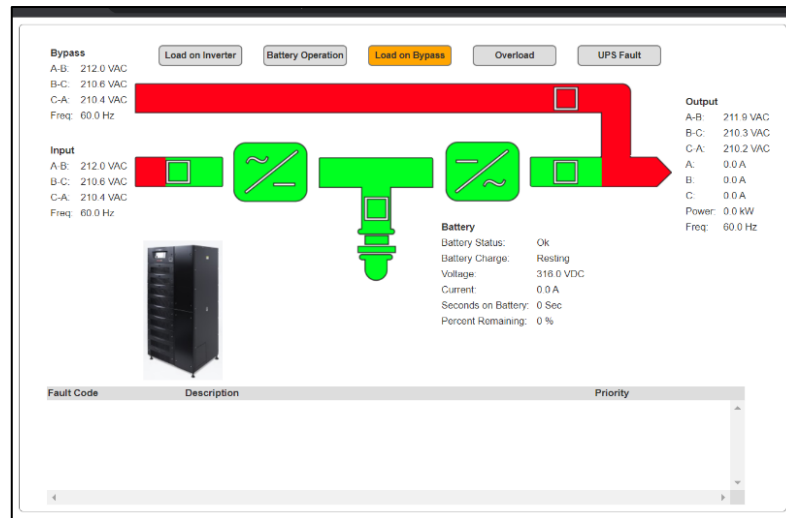


After activating Anonymous Access, it is possible to view the monitoring screen only. It is also possible to create a small html page and set up an i-frame to show the web server inside larger websites or content management systems.

This html code may help you to create the html website:

```
<html><head></head>
<body>
<center>
<p>I-Frame according to the UPS with the IP xxx </p>
<br><hr><br>
<iframe src="http://<Ihre IP>/www/devices/ups/page" height="600" width="850" name="iFrame" title="IFrame of my
UPS"></iframe>
</center>
</body></html>
```

As a result, the UPS monitoring screen will appear inside your html document.



Possible deep link to view UPS monitor screen only:

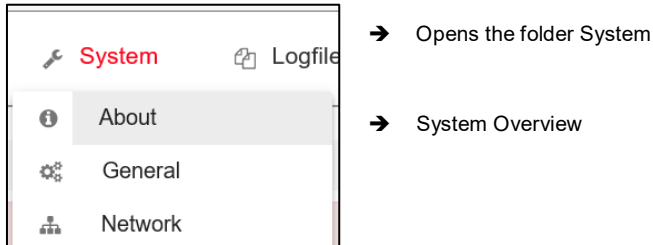
<http://10.10.10.10/www/devices/ups/page>

Opens the UPS monitoring screen

Note: By using the web query directly you will notice the URL inside your web browser will change. This is because you start a page request but the web server on the CS141 responds with a different page and will redirect you automatically. Since the page behavior is dynamic the response page may change accordingly. However, the HTML request is standardized with the above deep link and will be served as long as the Anonymous login is active.

4.9 System Overview

The system overview is accessed by navigating to the following menu.



After completing all the basic settings, the advanced system overview will list available information about the CS141.

The system overview is divided into several sections:

4.9.1 System

Name	CS141BL	→ CS141 version
Version	CS141-SNMP V1.87.51 191220	→ Current CS141 firmware
License	Pro Edition	→ Used license key
Manufacturer	Mitsubishi	→ Manufacturer name
UPS Model	Mitsubishi 9900CX	→ Configured UPS
Location		→ Location of the device
System Contact		→ System contact staff or department
Time	2000-01-03 01:11:13 (UTC) Coordinated Universal Time	→ Current system time and time zone
Uptime	0 days, 0 hours, 27 minutes, 0 seconds	→ Uptime since last reboot

If there are questions or some issues during installation technical support will need at least the following information:

- Firmware
- UPS model and type
- Uptime since last reboot

4.9.2 Hardware

Serial No.	1003600455	→ System serial number
Features	bch16	→ Hardware revision

4.9.3 Network Settings

Network	
MAC Address	00-30-d6-14-21-3c → MAC-Address of your CS141
IP Address	192.168.200.113 → Configured IP Address
Subnet Mask	255.255.255.0 → Configured Subnet Mask
Gateway	192.168.200.1 → Configured Gateway
DNS Server	192.168.200.3 → Configured DNS-Server

The network settings show the current configuration:

MAC address: The Media Access Control is a worldwide unique address to identify a network device. This address is given by the manufacturer and cannot be changed.

IP-Address: Shows the current IP address assigned to the device. In configuration mode, the default IP address is 10.10.10.10, even if the IP address is changed by the administrator.

Gateway: Defines the network device that is allowed to accept and serve requests to the Internet. By default, the configuration mode uses IP 10.10.10.10

DNS: The DNS server provides the translation of names and IP addresses into reachable destinations within networks. In configuration mode, it is the IP 10.10.10.10

4.9.4 Connectivity

Connectivity allows a general overview of the services the CS141 currently provides.

Connectivity	
Devices	UPS → Devices according to COM 1
Services	Webserver, UNMS Server, SNMP Agent, Modbus Slave, ... → Services this CS141 device provides

Devices simply indicates a UPS can be connected to the CS141, but not the model of UPS.




Services define the software-related services installed and started on the CS141 that communicate with additional devices as well as software.

4.10 Switch to Operating Mode

After completing basic configurations, move the slider to the desired position. After reboot, the device will run in the desired mode. If necessary, the device can fall back to configuration mode by setting the slide switch to the configuration mode position.

Note that the current switch position will generally take effect after rebooting the CS141.

The table below shows the regular operation modes available to the CS141.

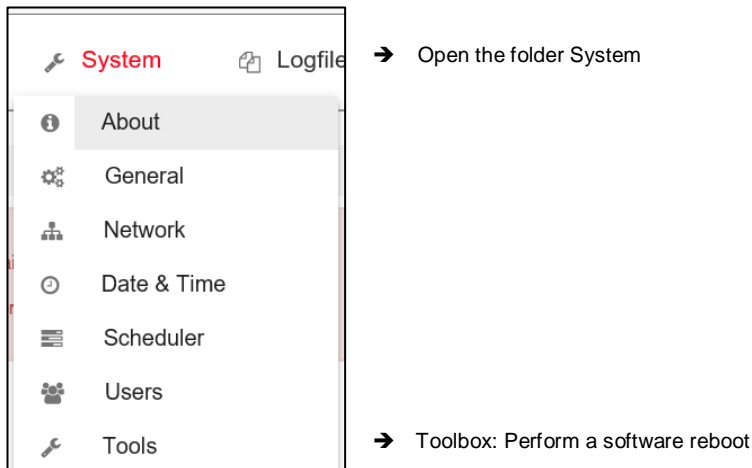
<p>Slide switch center position:</p> <p>Enables configuration mode. After reboot the hard-coded IP address 10.10.10.10 is active.</p>	
<p>Slide switch to the right:</p> <p>Automatic IP addressing: DHCP is activated and an IP address is set automatically. Check the MAC address of your CS141 to identify the IP address in the DHCP server table.</p>	
<p>Slide switch to the left:</p> <p>Use of the IP address values manually configured. If DHCP is used, the IP address needs to be blocked for single usage.</p>	

4.10.1 Hardware Reboot

Briefly disconnect power by pulling the power plug. The device will then boot to the appropriate operating state with the new hardware setting.

4.10.2 Software Reboot

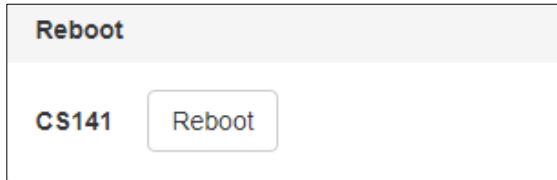
Software reboot can be accessed by navigating to the following menu.



The toolbox is restricted for administration usage only.

After logging in as admin, you will be allowed to use the toolbox with extended support features.

Afterwards it is possible to use the CS141 reboot option.



In both cases the restart only affects the CS141, the UPS will not be restarted.

5. System Notifications

5.1 Email

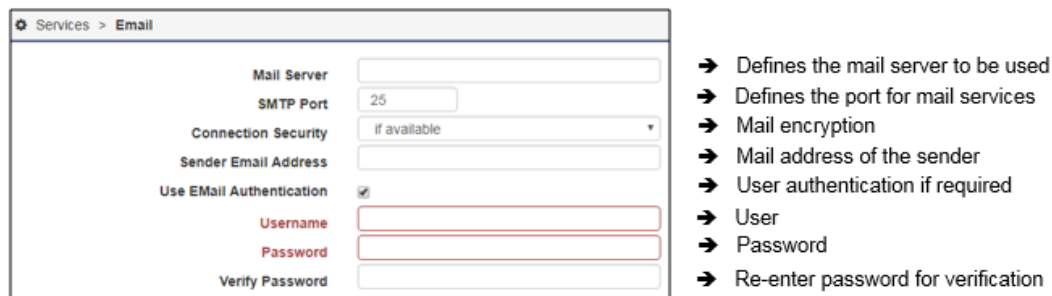
Email settings can be accessed by navigating to the following menu.



5.1.1 Email Settings

For this option, the necessary services must be configured.

One basic feature is the automatic notification via email and email traps. Due to the fact the CS141 does not provide a complete mail server, a valid email account must be configured.



Mail server

Enter the mail server to be used.

To ensure the maximum flexibility, the CS141 allows for an IP address as well as a URL of an external mail provider to be entered. Administrators can choose between an external provider or use their own mail servers.

Note: A connection to the Internet to access external e-mail providers does not mean an external provider will allow the service for free. Sometimes they block service e-mails without stating reasons or notifying the customer they have blocked the e-mails. Check with the e-mail provider before proceeding to make sure critical messages aren't lost.

SMTP Port

Defines the port used by the mail client to communicate with the mail server. Ports are standardized but in some cases, administrators may need to choose a different port configuration to ensure communication. This must be determined by the local administrator.

Connection Security

Select the encryption type used by the CS141 for sending the emails:

- None - no encryption required
- If available - STARTTLS
- Force encryption - SSL / TLS

Sender Email Address

Enter the email address that will show on the recipients email.

Email authentication – user and password

Depending on its configuration, email servers either use the email address as their username or their own user ID and password to receive emails.

Please contact your local network supervisor to understand how your email server is setup.

5.1.2 Error Log Options

The CS141 offers the ability to send email traffic as a blind carbon copy.

Advanced	
Format	<input type="checkbox"/> Database Interface Format
Log	Errors only <input type="button" value="v"/>
Automatically send a Copy	<input type="checkbox"/> for all sent Emails <input type="checkbox"/> On scheduled Jobs

- Select the mail format
- Logging email traffic
- Additional blind carbon copy mail jobs

Format

In some cases, emails will be stored by using database systems. This option enables sending emails in a database compatible formatted.

Log

This setting toggles the conditions whether a sent mail will be registered by event log. Administrators can choose:

- Errors only - Mails that indicate errors are recorded in the event log
- Always - Each mail is recorded as "sent" in the event log
- Never - The mails are sent but not recorded in the event log.

When Apply is pressed, the settings are transferred to the configuration and the service for sending mails is restarted.

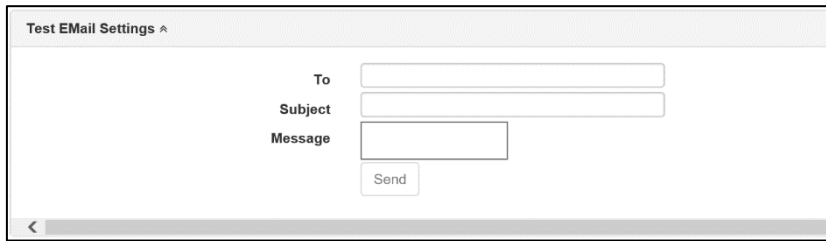
Note: Under some circumstances, automatically sending a copy for all emails may cause a flood of messages. Each message will be sent as another copy.

You may find a similar problem with logging the complete email traffic:

Too many entries in the event log quickly lead to confusing data when searching for a particular event during a timeframe.

5.1.3 Test Email

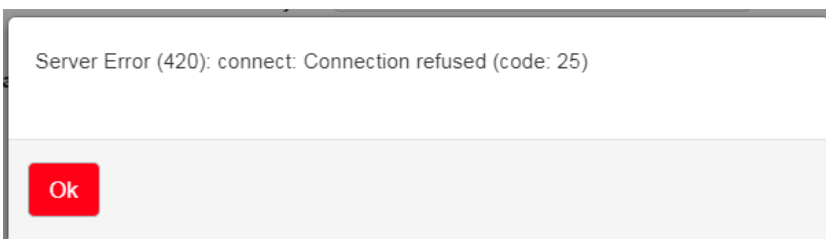
This function will be available after successful saving the email configuration. It allows you to send a test email to any valid email address to test the connectivity.



- Email address of recipient
- Subject line
- Text body of the email

5.1.4 Email Error Message

The connection refused error indicates that the CS141 cannot establish a connection to the configured the email server.



The reasons for this behavior can vary. Some basic reasons may be:

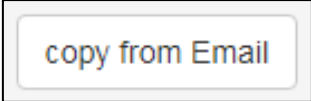
- Wrong encryption type
- Wrong or closed ports
- DNS / Gateway settings are wrong
- The email provider does not allow this kind of mail traffic.

5.1.5 Email Traps

Email trap messages are automatically generated by the CS141 for information and status reports. The difference from a normal email is that there is no option to enter custom text or define a different recipient.

A valid email account must be configured to send email traps.

In some cases, administrators may need to use different email accounts if they choose to use one email account the CS141 offers the ability to copy registration data directly from the standard email configuration.



By pressing the copy from Email button the CS141 fetches the information already entered with the exception of the password. The password of the email account needs to be verified by entering manually.

5.2 Modbus

The CS141 is capable of communications using Modbus TCP/IP and Modbus RTU through RS485. The Modbus service must be enabled in section 4.6 or no Modbus information will be available.

For the register list please refer to the appendix.

5.2.1 Modbus RTU Pin Assignment

As a default a Modbus plug is installed on delivery. The plug can be removed and later simply assembled to ensure a fast and intuitive wiring procedure.

Please note the plug alignment before removing and re-insert it in the same orientation.

Before wiring ensure the terminal strips are at top of the cable slots and not below them.

By doing so the following PIN assignment can be used:



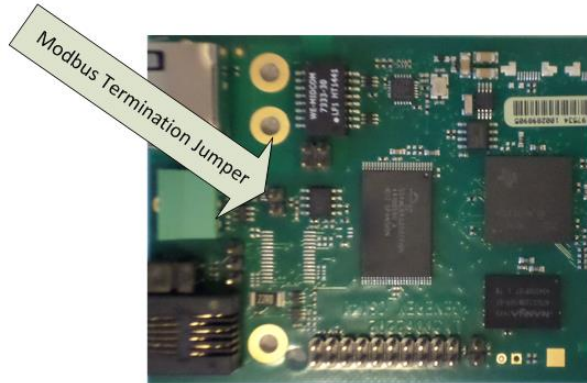
PIN	Description
1	GND
2	RS485 A+
3	RS485 B -

To make the connections push on the orange spring mechanism and insert the appropriate cable. The clamp will automatically lock the cable in the desired position when released.

5.2.2 Modbus RTU Terminating Pin

Since Modbus expects termination resistors on both the first and last devices in the bus network the CS141 offers an optional 120-ohm resistor that can be enabled by setting a PIN.

As a default, this PIN is set to OFF. The CS141 is configured not to be the last device within the Modbus network. If required, this pin can be set manually.



5.2.3 Modbus TCP/IP

While the CS141 can be integrated into a bus with the RS485 interface, Modbus TCP/IP uses a point-to-point connection via Ethernet. This Modbus port is commonly used when transferring Modbus data from the UPS to another system or monitoring software. When using Modbus TCP/IP no terminating resistors are necessary.

The connection for using Modbus TCP/IP is the LAN port located on the front of the CS141.



The CS141 complies with RFC1628 standards. If required the MIB can be provided by contact Mitsubishi Electric Power Products, Inc UPS support.

5.2.4 Modbus Function Codes

The CS141 supports the following function codes:

01H -	Read Coils
02H -	Read Discrete Inputs
03H -	Read Holding Registers
04H -	Read Input Registers
05H -	Write Single Coil

5.2.5 Modbus Error Codes

Except broadcast messages, where the master device sends requests to the slave device, the master expects a clear and valid response from the slave being queried. If the answer does not match with expected specifications, the packet will be discarded with a corresponding error message.

There are several possible events that may occur when a slave answers to a master's request:

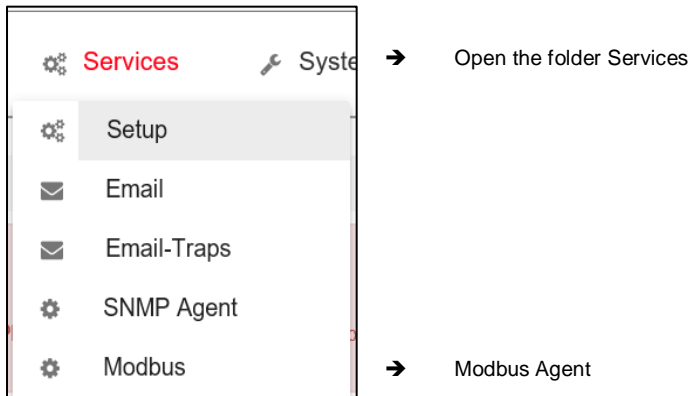
1. The slave responds accordingly with a data packet that is both, correct and valid: The master handles it accordingly.
2. The slave unit does not receive the request the master device sends: This event occurs, for example, in case of a communication error. From the point of view of the master the request was not answered. As a consequence, the master will assume an appropriate timeout incident.
3. Master or slave will send invalid queries / answers: Such a phenomenon can occur if the termination resistors are not set up correctly. Although data is being sent there are clear parity, LRC, or CRC errors within the data packet. Since invalid packets are discarded, the slave will usually ignore an invalid request without answering. However, the master's reaction will differ. In general, it will handle a faulty slave response with a corresponding timeout message.
4. The slave receives a valid request that cannot be answered: This occurs if a requested register does not exist. If the slave unit receives a valid request, but the requested readings are not available, the slave unit will respond a specific exception message in order to inform the master about the reason for this error.

The CS141 provides the following error codes:

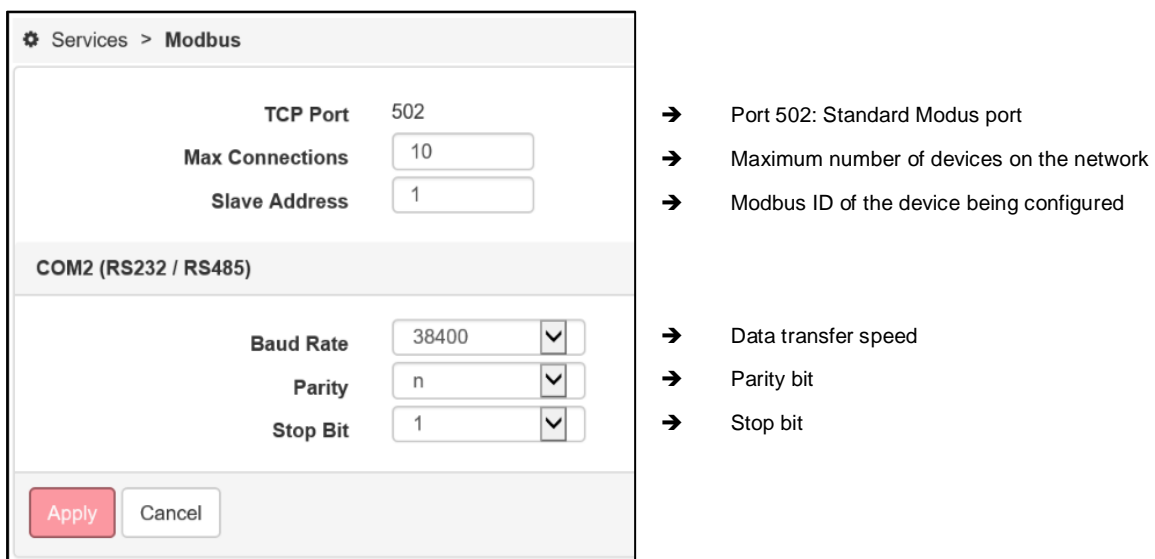
- 02H – Illegal Data Address: The address data obtained with the valid request is not a valid address servable by the slave.
- 03H - Illegal Data Value: A contained value inside a valid request is not an allowed for this slave.
- 06H - Slave device busy: The slave has received a valid request, but is currently busy with a time consuming or time-critical process. As a result, he cannot serve the master for now. For the master, there is no reason to assume a timeout- he will repeat the request some time later.

5.2.6 Configuring Modbus

Modbus settings can be accessed by navigating to the following menu.



Once selected you will see the following screen.



TCP Port 502

The TCP port 502 is a static port setting within the Modbus standard that cannot be changed or customized without leaving standards. This port value is hardcoded inside the CS141 source code.

Slave Address

The Modbus slave is the ID that make a Modbus device addressable. The Slave ID mentioned by a master's query will cause this device to answer This ID may be customized, but only exist once inside a Modbus network.

Note: Doubling a Modbus Slave Address will not result in a complete network short-circuit. If the ID is requested by a Modbus master both addressed slave devices will respond. This will cause the Modbus Master to display misleading data accordingly or assume a timeout due to the fact the data packets are not valid.

Baud Rate

The baud rate defines the data transmission speed for Modbus queries and answers. Please note that the polling speed through the master must be identical to the answering speed configured at the slave to avoid communication lost issues.

Parity

When transmitting data in the form of a bit stream, the parity bit will ensure an error detection can be performed.

The value of the parity bit is calculated by the transmitter and communicated to the receiver accordingly. The receiver of the data stream uses the same mathematical algorithm to verify valid data and find corrupt data packets. The sender and receiver must therefore agree beforehand on how to perform the parity calculation.

The CS141 offers three options for parity control.

- n - No parity control
- o - Odd parity control
- e - Even parity control

By default, the CS141 is shipped with the value n for no parity check.

NOTE: If using Modbus RTU and no information is being read by the Modbus Client, turn off the Modbus Server using section 4.6, save the settings, and then reinitialize the Modbus Server

Stop Bit

A stop bit defines the end of a data word within a data stream and is used in asynchronous data transfer.

The Stop Bit function defines whether the CS141 should send one or two corresponding stop bits.

Note: If more than one Modbus device is on the same ID they will all start sending data to serve the master's query.

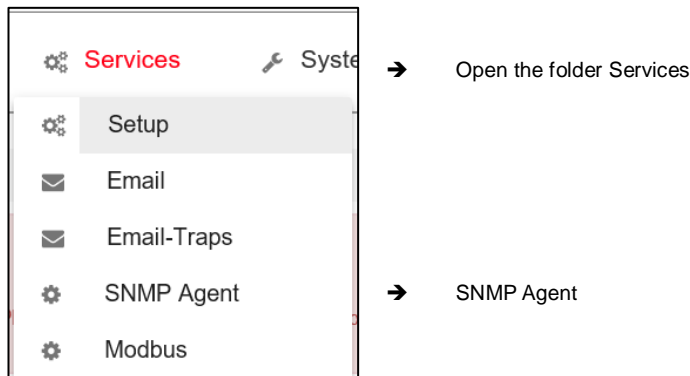
Amongst other things the start and stop bits within the network will begin cross talking causing problems with the assignment of valid and invalid data packets.

Selecting Apply will save the entered data and restart the corresponding service, a complete reboot of the CS141 is not required.

Selecting Cancel will discard the entered data and return to the current state.

5.3 SNMP

SNMP settings can be accessed by navigating to the following menu.



The CS141 can fully be integrated into a network with SNMP monitoring. The built-in SNMP agent regulates both receiving and sending corresponding requests and supports SNMP V2 and SNMP V3.

Note: SNMP V1.0 is not officially supported by the CS141. We recommend the use of version 2.0 and upward. However, since V1.0 is largely included in V2.0 the CS141 will respond to SNMP V1 requests. Support for troubleshooting use of SNMP V1 is not provided.

Once selected you will see the following screen which is the overview of the settings for both versions of SNMP.

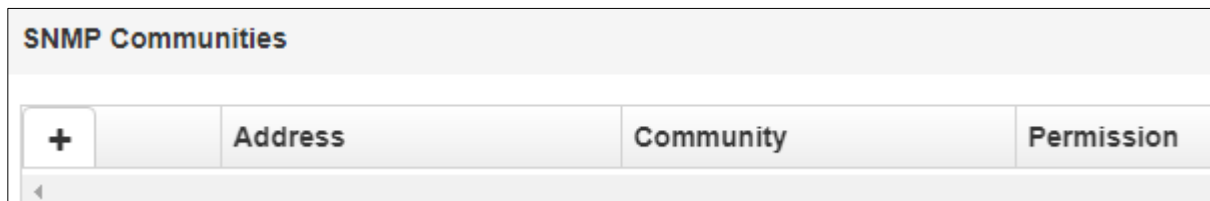


The screenshot shows the SNMP configuration interface. At the top, 'SNMP Version' is set to 2. Below, there are two sections: 'SNMP Communities' and 'SNMP Trap Receivers'. Each section contains a table with columns for 'Address', 'Community', and 'Permission'. The 'SNMP Communities' table has one entry with Address '10.10.10.25', Community 'public', and Permission 'Read only'. The 'SNMP Trap Receivers' table has one entry with Address '10.10.10.25' and Community 'public'. At the bottom, there are 'Apply' and 'Cancel' buttons.

5.3.1 Configuring SNMP V2

The overview shows all configured SNMP communities and trap receivers.

To add a new device to communities click on the plus sign next to where it says address.



The screenshot shows the 'SNMP Communities' section with a table header. The header row includes a plus sign (+) in a column, followed by 'Address', 'Community', and 'Permission' columns. Below the header, there is a horizontal scrollbar.

Once selected you will see the following screen.



The screenshot shows the 'Add Community' form. It has three input fields: 'IP Address' with the value '10.10.10.10' and a note 'IP address required', 'Community' with the value 'public', and 'Permission' with a dropdown menu set to 'Read only'. At the bottom, there are 'Save' and 'Cancel' buttons.

- IP address of the authorized device
- Community name for access authorization
- Access authorization type
- Save changes / cancel configuration

IP address

Under IP Address, enter the IP address of the authorized computer to allow access to the CS141 via SNMP v2. Thereby the name of the community defines the authorization group.

Permission

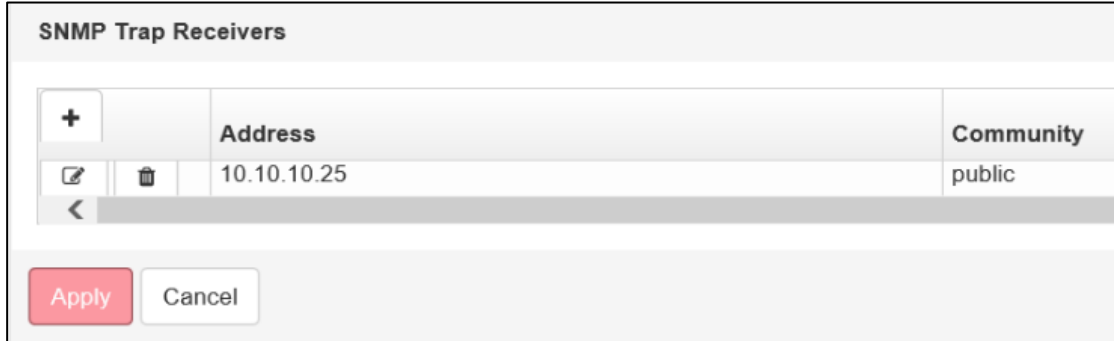
Defines permissions during access:

Read only - Devices dealing inside this permission group have read-only permissions

Read/Write - Devices dealing inside this authorization group can read and write /delete data packets.

With Save button the CS141 applies the settings and the SNMP agent will be restarted. The CS141 will not need to be rebooted.

To add a new trap receiver, click on the plus sign next to where it says address.



The screenshot shows the 'SNMP Trap Receivers' configuration interface. It features a table with columns for 'Address' and 'Community'. A plus sign (+) is located in the first row of the table, indicating where to click to add a new receiver. Below the table, there are 'Apply' and 'Cancel' buttons.

SNMP Trap Receivers		
	Address	Community
+		
	10.10.10.25	public

Apply Cancel

Once selected you will see the following screen.



The screenshot shows the 'Add Trap Receiver' configuration screen. It has two input fields: 'IP Address' with the value '10.10.10.10' and a note 'IP address required', and 'Community' with the value 'public'. At the bottom, there are 'Save' and 'Cancel' buttons.

Add Trap Receiver

IP Address: 10.10.10.10 IP address required

Community: public

Save Cancel

- IP address of the authorized device
- Community name for access authorization
- Save changes / cancel configuration

Enter the recipient's IP address as well as a valid community.

With Save button the CS141 applies the settings and the SNMP agent will be restarted. The CS141 will not need to be rebooted.

Note: There are two ports required by default for correct operation of SNMP traps.

Port 161: Required by the agent on the device to receive the requests

Port 162: Required by the management station to receive messages

If these ports are block the communications will not work

The trap receiver can be subsequently tested by pressing the test button. The corresponding test message should be displayed directly in your management program.

Test SNMP Traps

You can send a powerfail trap and a power restored trap to the receivers defined below.
Please note: To test newly added receivers, you must save the configuration first.

192.168.200.17	public		Test
----------------	--------	--	------

Note: Trap messages are automatically generated messages that do not request confirmation, therefore an agent never knows if their trap message has arrived to the client. Due to this fact reception logging is not possible.

5.3.2 Configuring SNMP V3

The overview shows all configured users.

Since SNMP V3 is user based single users must be configured instead of communities. To add a new user, click on the plus sign next to where it says user.

SNMP User

	User	Access
+		

Once selected you will see the following screen.

Add User

User

Permission Read/Write ▼

Security Level No Security ▼

- Add user name
- Toggle read/write permissions
- Access control to the CS141
- Save changes / cancel configuration

User

SNMP v3 allows the possibility of setting up authorized IP addresses and user groups. Administrators need to add a local user inside the CS141.

Read-only / Read Write

As a standard any user gets the permission for both reading and writing. In some cases, this may be not allowed by administrators. To prevent SNMP users from writing data, activate the option Read only.

Security Level

Defines security level and password control to access the CS141 using SNMP V3.

No security -	No passwords or encryption is required
Authenticities -	Single password request
Authentication and Privacy -	The connection is additionally encrypted and two passwords are required.

Note: In order to access data, the encryption type must be identical otherwise no connection will be established.

To set up a trap receiver dealing with SNMP V3 you need to create a suitable user. This user can then be selected as the trap recipient in SNMP V3.



- IP address of the receiver
- Selection of the previously configured user
- Save changes / cancel configuration

The Trap receiver can be subsequently tested by pressing the test button. The corresponding test message should be displayed directly in your management program.

Test SNMP Traps

You can send a powerfail trap and a power restored trap to the receivers defined below.

Please note: To test newly added receivers, you must save the configuration first.

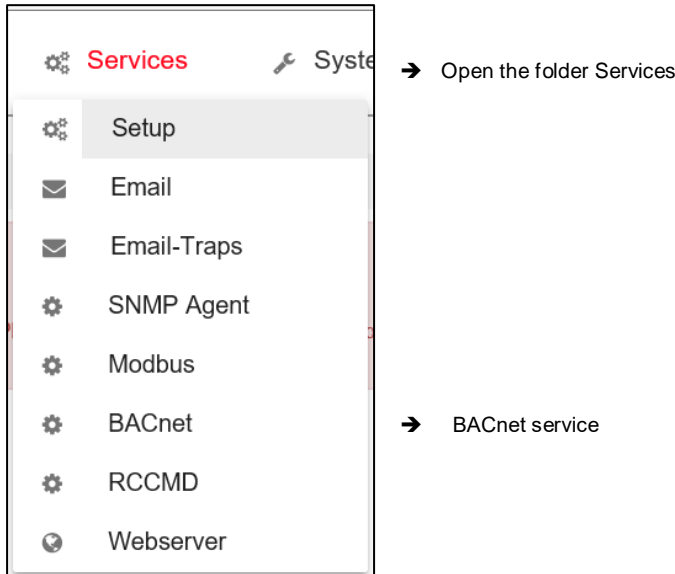
192.168.200.17

My_User

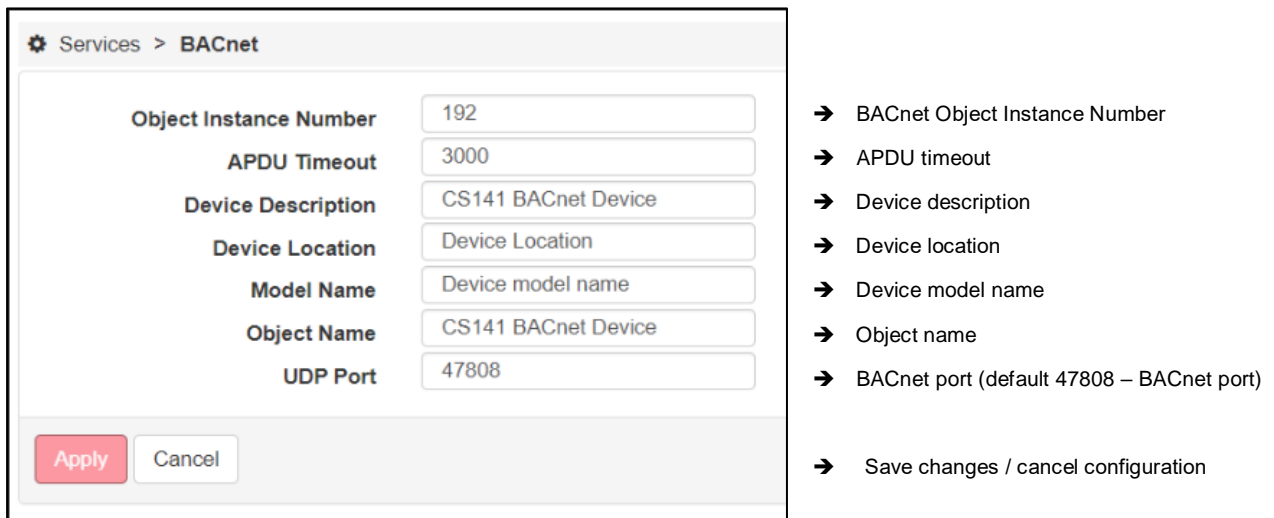
Test

5.4 BACnet

BACnet settings can be accessed by navigating to the following menu.



To start configuration, go to Services and press BACnet.



Object Instance Number

A number that identifies a device uniquely on the entire interconnected BACnet network. No other BACnet device may have the same Object Instance Number anywhere on the network.

APDU Timeout

Sets the time in milliseconds that the module will wait for a response from a device after sending a request

Device Description

This is a simple description of the device that will show when the BACnet object is read and is used to help the operator distinguish which device it is on large BACnet networks.

Device Location

This is a simple description that will show when the BACnet object is read and will give a location to help tell the operator distinguish what device it is on large BACnet networks. Potential uses would be to use the room name/number where the physical device is located.

Device Model Name

This is a description that will show when the BACnet object is read and gives a model name of the device in case there are numerous different devices from the same manufacturer on a BACnet network.

Object Name

This is the same as the Device Description and just allows the operator to give the device a unique name for distinguishing the device on a large BACnet network.

UPD Port

This is the port number the BACnet information will be transmitted on. The standard BACnet port is 47808, but this can be changed to suit specific IT infrastructures or requirements.

Once all information is entered, press the “Apply” button to save the configuration.

6. UPS Configuration

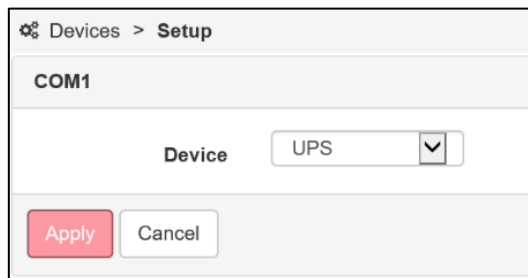
6.1 COM Port Settings

COM port settings can be accessed by navigating to the following menu.

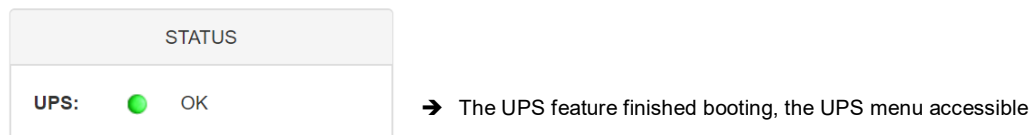


To start configuration, go to Devices and press Setup.

Ensure that UPS is selected at COM 1, it is the only option



The CS141 will display the current starting phase as well as the success of the activation at the upper task bar.

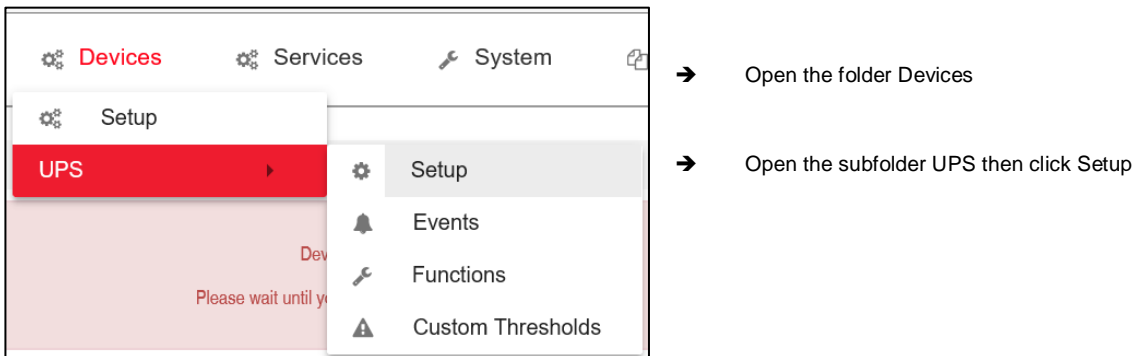


Please note that only a dummy UPS monitor without function has been started at this point, even if a UPS is apparently connected and in operation.



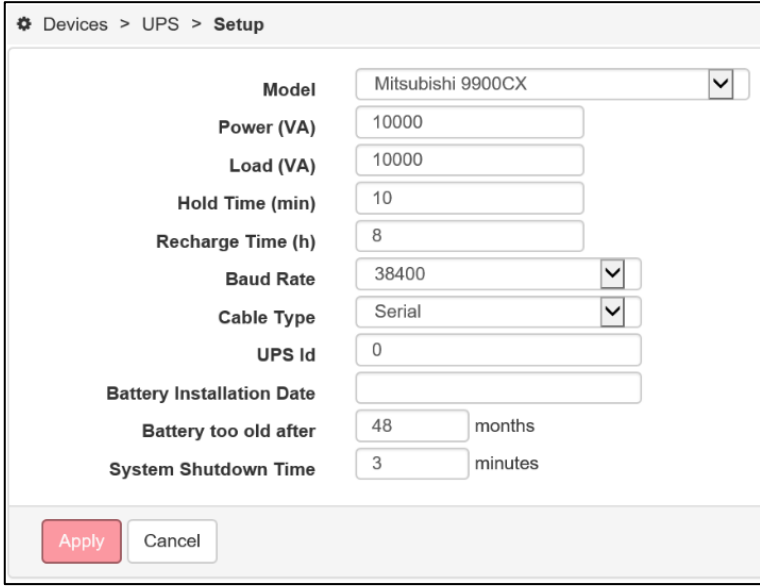
6.2 Configuring a UPS

UPS configuration can be accessed by navigating to the following menu.



Proceed to submenu UPS and click on Setup to enter the basic UPS configuration menu.

Once selected you will see the following screen. This configuration dialog allows to choose the UPS the CS141 is installed on. Recommended values will be entered automatically by selecting a UPS.

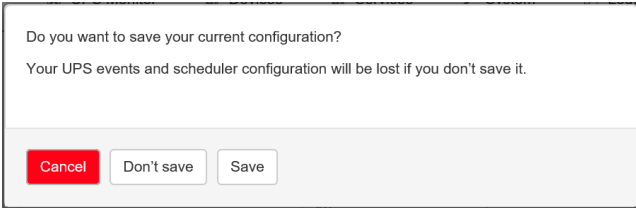


This menu allows you to change the adjustable information about the UPS.

Model

Defines the listed default setting of a UPS including the corresponding communication protocol. When your UPS is listed and communication has been established telemetry of the UPS typically provides all the necessary data that the CS141 needs to calculate and display autonomy times.

Note: Changing the UPS model will also reset the configuration of the UPS events. The CS141 offers the possibility to create a corresponding backup of the event configuration beforehand.



Power (VA)

Defines the maximum power in VA the selected UPS in can provide.

Load (VA)

This value defines the maximum load connected to the UPS. The maximum possible value is less or equal to the value entered at Power (VA).

Hold Time (min)

If main power fails, the batteries of the UPS will ensure this operating time if 100% load is used. The real-life uptime is determined dynamically by the percent of usage, if you use 50% the hold time will raise accordingly.

Note: Behind the values of power (VA), load (VA), holding time, and battery charging time is a stored mathematical formula that allows the CS141 to independently calculate battery operating time and trigger corresponding system events.

Baud Rate

Different protocols provide different speeds of data transmission. The baud rate defines the speed at which data can be sent and received. An incorrect baud rate can cause communication problems between the CS141 and the UPS.

Cable Type

This should always be set to serial.

UPS-ID

NOT USED

Battery installation date

To help keep track of battery installations you may enter the date of when the batteries went into operation.

Battery too old after

If entered the CS141 automatically indicates when the regular operating period for the installed batteries will expire. By default the CS141 logs in with appropriate system notes after 48 months. Editing this value will extend or shorten the default time period until the CS141 will start sending maintenance notifications.

System shutdown time

In principle the system shutdown time is the last emergency shutdown event that will be executed just before the UPS itself will shut down to prevent battery damage. This value can be used to trigger an according system event.

Apply / Cancel

Apply allows you to save and restart the UPS monitoring service on the CS141. Cancel will abort the configuration process and withdraw all settings.

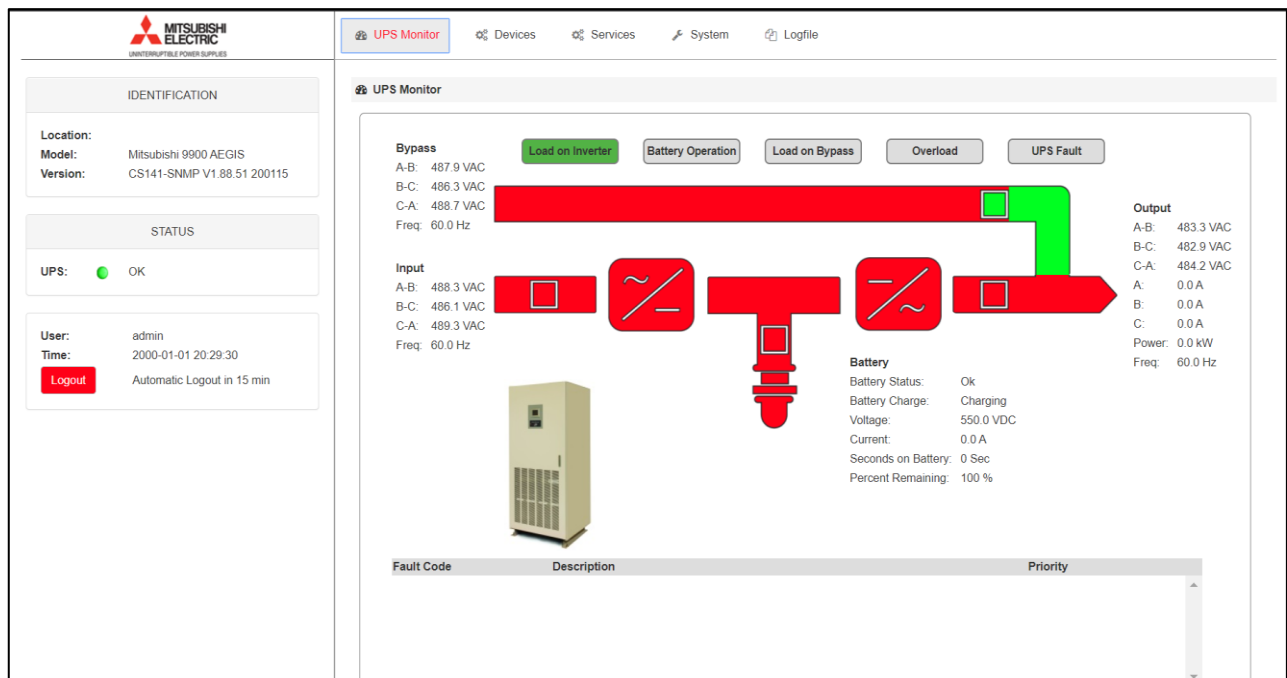
6.3 UPS Monitoring Screen

After all UPS settings have been entered correctly administrators can check the UPS's current status in real time by using the UPS monitor.

You can access the UPS monitor by selecting UPS monitor along the top of the web interface



After selecting the UPS monitor you will see the main screen which shows real time data, UPS operating state, a power flow diagram, and the current UPS fault code list.



IDENTIFICATION

Location:
Model: Mitsubishi 9900 AEGIS
Version: CS141-SNMP V1.88.51.200115

STATUS

UPS: ● OK

User: admin
Time: 2000-01-01 20:29:30
Logout Automatic Logout in 15 min

UPS Monitor

Bypass Load on inverter Battery Operation Load on Bypass Overload UPS Fault

Input
A-B: 487.9 VAC
B-C: 486.3 VAC
C-A: 488.7 VAC
Freq: 60.0 Hz

Output
A-B: 483.3 VAC
B-C: 482.9 VAC
C-A: 484.2 VAC
A: 0.0 A
B: 0.0 A
C: 0.0 A
Power: 0.0 kW
Freq: 60.0 Hz

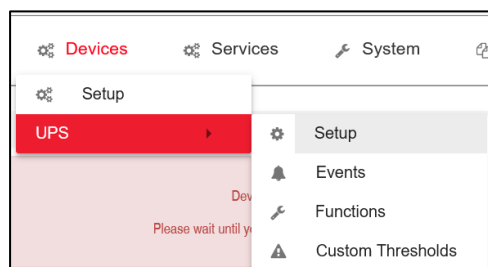
Battery
Battery Status: Ok
Battery Charge: Charging
Voltage: 550.0 VDC
Current: 0.0 A
Seconds on Battery: 0 Sec
Percent Remaining: 100 %

Fault Code	Description	Priority

6.4 UPS Event Handling

The CS141 has the ability to respond to incidents independently and inform the responsible personal to the event.

Event settings can be accessed by navigating to the following menu.



- ➔ Open the folder Devices
- ➔ Open the subfolder UPS
- ➔ Event handling configuration

An event receives an action, a job. This job will be executed when the event occurs. These jobs differ in central role as well as its direct function:

- Information - These jobs can be executed as often as desired and only fulfill the purpose of information. Depending on the configuration information can be sent once or cyclically as long as an event is pending, the nature of the event does not matter. If the situation changes and the event does not come to fruition an according job will not continue.
- Action - These jobs are designed to switch, trigger, start emergency routines, etc. These jobs are triggered as soon as an event occurs. They differ from information jobs due to the fact administrators have to terminate these jobs by using corresponding counter-rotating jobs. In some cases there are counter-events to be used and others need to be configured manually.

The jobs can be configured at any time.

In order to test a job, two conditions need to be adjusted according to the job:

1. Jobs according to emails require valid email account data
2. Jobs based on the TCP/IP settings require a valid network configuration

Before continuing configuration ensure all access data is available for configuration, network settings are correct, and that the CS141 is set to the regular operating mode.

6.4.1 Managing Jobs

Under Devices, open the UPS submenu and go to Events.

Please note that both the functions as well as designation will differ by usage of different UPS systems.

These are the icons the CS141 provides:



→ Open /close tables

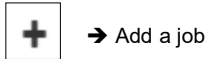
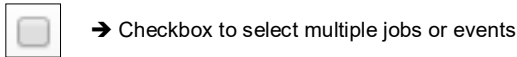
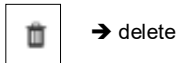


→ Edit an existing job



→ Test an existing job

Symbols providing two functions:



Note: Dual function symbols have two different meanings:











Depending on where you see them they refer to either all events or to a specific event or job. This dual functionality allows you to add a specific event to specific or all system events without the need of entering each job individually.

6.4.2 Setting up a Job

Managing jobs for a system event always follows the same rules. As an example the following system events are selected:

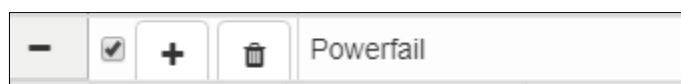
>	<input type="checkbox"/>	+		Powerfail	3	1	0	1	0
>	<input type="checkbox"/>	+		Power restored	3	1	0	1	0

Select > to open the job table:

-	<input type="checkbox"/>	+		Powerfail	3	1	0	1	0	0
				Job Type	When	Parameter				
				Log	Periodic all 100s, immediately	{ "text": "Powerfail" }				
				RCCMD Trap	Once, immediately	{ "text": "Powerfail on #MODEL . Autonomietime #AUTONOMTIME min." }				
				EEmail Trap	Once, immediately	{ }				

For the event Powerfail a total of 3 jobs are already configured. These jobs were loaded as a recommended default configuration when selecting a UPS. To change or remove just click on the corresponding icon.

The CS141 allows you to delete all jobs within a system event. To do so activate the checkbox in the line for power failure and press the symbol for deleting events. After pressing delete all jobs associated with this one event will be deleted from the list.



Note: Deleted jobs cannot be retrieved, they must be recreated or restored by using a backup. To prevent accidental deletion administrators will be prompted to confirm their decision to delete all entries inside an event.

To add a job to the power failure event press + at the event line. This will trigger the configuration dialog which will guide you through configuration process.

The following jobs are currently available:

Log	Inserts a free definable message into the event log.
Email*	CS141 will send an email.
Email Trap*	CS141 will send Trap Mails
RCCMD Shutdown*	CS141 will transmit a shutdown signal to one or more RCCMD clients.
RCCMD Message*	CS141 will send an RCCMD message to one or more RCCMD clients.
RCCMD Execute*	CS141 will send a command to execute a custom file.
RCCMD Trap*	CS141 will send an RCCMD trap message.

* Additional software may be necessary

The Search function is a quick method to find jobs configured within events.

Event	Jobs	Log	Email	Email Trap	RCCMD Shutdown	RCCMD Message	RCCMD Execute
<input type="text" value="contains..."/>	<input type="text"/>						

The CS141 provides two basic options:

Event contains

Search for a UPS event. By typing a part of an event all events according to the text fragment are listed.

Jobs

Lists events containing a number of jobs defined by this value. As an example if you want to know how many events contain 3 jobs enter 3. All events containing this number of jobs will be listed.

6.4.3 How to Configure a Job

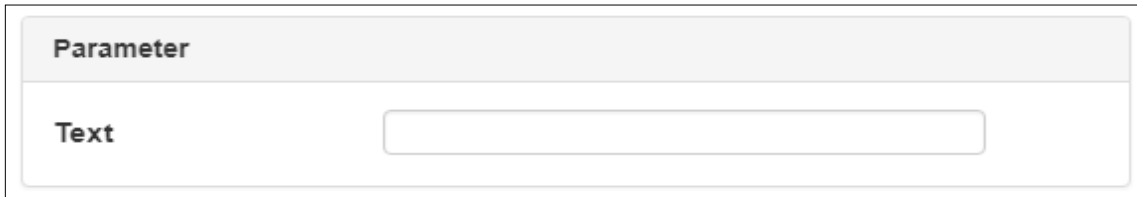
Press + at an event to open the job configuration dialog.



A dialog box titled "Job" with a dropdown menu showing "Log".

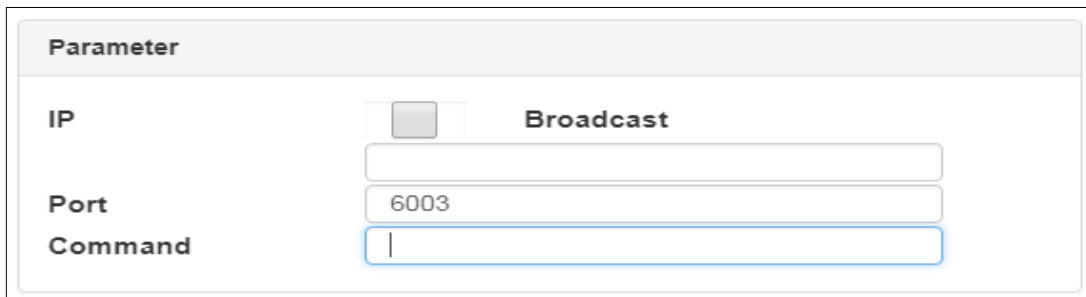
Different jobs provide different parameters to be configured.

Example 1: Log – Enter the text the CS141 shows at Event Log.



A dialog box titled "Parameter" with a "Text" input field.

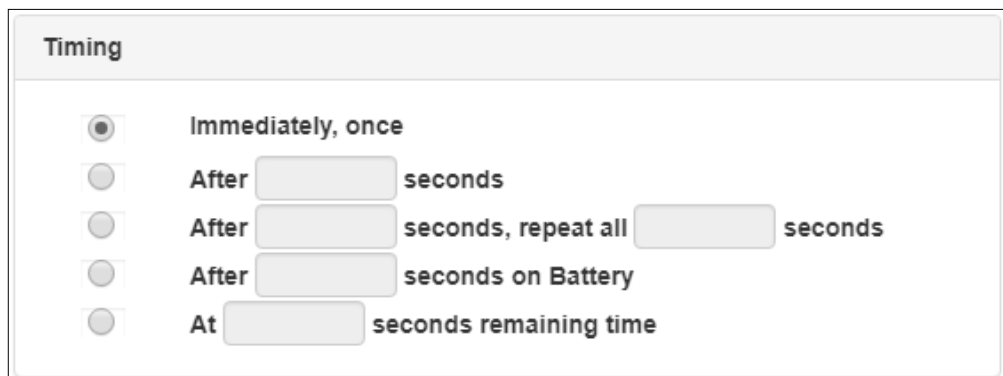
Example 2: RCCMD execute – Due to the fact that RCCMD needs an IP address data parameters will change.



A dialog box titled "Parameter" with fields for "IP", "Port" (6003), and "Command". There is also a "Broadcast" checkbox.

6.4.4 Job Timing

The CS141 provides many system events a job can be assigned to. Some jobs allow to configure advanced timing.



A dialog box titled "Timing" with radio button options for job execution timing:

- Immediately, once
- After seconds
- After seconds, repeat all seconds
- After seconds on Battery
- At seconds remaining time

Immediately, once

As soon as an event happens this job is executed at once and not repeated.

After XXX seconds

The CS141 will wait a pre-defined time in seconds and then execute the job. If the event is no longer active before time is up the job will not be executed.

Repeat all XXX seconds

The job is repeated cyclically until the event no longer is no longer active.

After XXX seconds on battery

If the event forces the UPS will to switch to autonomous mode the job will be executed if the UPS remains in this state for a pre-defined period of time. For example if 300 seconds is set this job will only be executed if the UPS operates in autonomous mode for 300 seconds.

At XXX seconds remaining time

The job is executed when the remaining UPS operating time is reached or undershot. Note based on the current load this time value becomes flexible.

The time management of jobs to be performed is difficult since one has to distinguish conceptually between two different points of view.

The following example according to the event power failure example earlier illustrates the differences.

In case of a power outage, the UPS will take over power and protect the servers until.

1. The batteries are depleted
2. Main power is available again

As soon as the UPS switches into autonomous mode it will start two different timers.

A linearly advancing time in seconds starting at 0.

If a job is to be executed after 45 seconds it will only be executed if the event is pending for at least 45 seconds. If the event is terminated before 45 seconds consequently the job is not executed.

A relative clock that counts backwards depending on the connected load currently used.

This becomes tricky if the UPS will operate with a load of 100%

If some of the machines connected to the UPS will be shut down after 3 minutes and cause the load to drop to 50% it will take effect this way: Because of dropping load the clock would jump from 4 minutes to 7.5 minutes.

Both methods to count come with specific advantages and disadvantages.

The first timer gives a clear time window to sequent jobs but ignores the actual remaining time of the UPS:

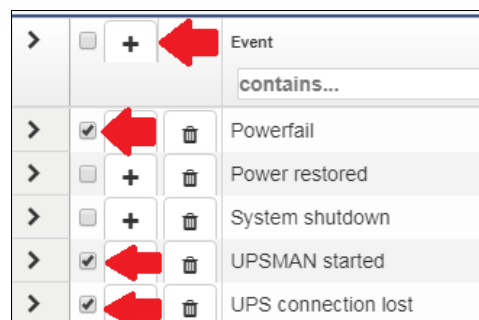
If there are several small power failures in a row a server shutdown would not work with a time delay of 5 minutes if battery power is left to ensure power a maximum of 4 minutes.

The second timer is difficult to calculate and varies depending to the current load. As a consequence, there may be a time lag to execute configured tasks: 5 minutes remaining time cannot be achieved over a longer period of time if the circumstances increase the remaining time. For example, some systems will be shut down at 7 minutes remaining time. On the other hand, a predetermined sequence of events can get mixed up as soon as the circumstances correct UPS uptime down and cause the normally sequentially configured jobs to trigger simultaneously.

Note: Basically a shutdown using remaining time is useful since the actually existing battery charge can be included. If a special order must be observed for jobs it makes sense to use the linearly forwarding clock for scheduling.

6.4.5 Adding Jobs to Several Events

Under certain circumstances a configuration may require multiple events be assigned the same job. To assign these jobs to more than one event it is possible to select each event individually to define this job.



To speed up the process select the events that should receive the same job with the check boxes, then click on the +. By doing so the same jobs are created inside the selected events.

6.4.6 Deleting a Job

If system events are no longer needed, administrators should remove these jobs to prevent unexpected incidents.

Deleting a single job

Open the event tab by clicking >

-	<input checked="" type="checkbox"/>	+		Powerfail	3	1
				Job Type	When	
				Log	Periodic all 100s, immediately	
				RCCMD Trap	Once, immediately	

Choose the job you want to delete and press the small trash icon. The job will be deleted immediately.

Deleting all jobs within an event

Open the event tab by clicking >

-	<input checked="" type="checkbox"/>	+		Powerfail	3	1
				Job Type	When	
				Log	Periodic all 100s, immediately	
				RCCMD Trap	Once, immediately	









To delete all jobs inside an event, choose the checkbox of the desired event then press the small trash icon. By doing so all jobs listed inside this event will be deleted immediately. Accidentally deleted jobs need to be configured again.

Note: The CS141 allows to add, edit and delete any job. The event list itself is hard-coded and depends on the UPS you are using. Events cannot be deleted or edited by any user.

7. Custom Thresholds

The CS141 supports the feature to allow you to customize the limits for some UPS specific events.

Custom threshold settings can be accessed by navigating to the following menu

 Devices	 Services	 System	→ Open the folder Devices
 Setup			→ Open the subfolder UPS
UPS	 Setup		→ Event handling configuration
	 Events		→ Custom defined system even configuration
	 Functions		
	 Custom Thresholds		

The configuration is done via two menus:

Custom thresholds to define and customize settings.

Event menu to assign jobs.

		Min	Max
<input type="checkbox"/> Battery voltage	out of range	<input type="text" value="0"/> V	<input type="text" value="0"/> V
<input type="checkbox"/> Input voltage P-N	out of range	<input type="text" value="0"/> V	<input type="text" value="0"/> V
<input type="checkbox"/> Output load	greater than ▾	<input type="text" value="0"/> %	
<input type="checkbox"/> Seconds on Battery	greater than ▾	<input type="text" value="0"/> s	
<input type="checkbox"/> Battery charge	less than ▾	<input type="text" value="0"/> %	

>	<input type="checkbox"/>	+	🗑️	Battery voltage Threshold Warning Low On
>	<input type="checkbox"/>	+	🗑️	Battery voltage Threshold Warning Low Off
>	<input type="checkbox"/>	+	🗑️	Battery voltage Threshold Warning High On

7.1 The Difference Between Warnings and Alarm Levels

The custom thresholds are identical for warning and alarm levels but they are listed separately in the UPS event menu. Furthermore, they will be listed inside log files as a warning or an alarm.

This will allow you to configure warning and alarm behavior containing different values.

These conditions can be set up:

out of range - the event, regardless of alarm or warning, is triggered if the measured value falls below or exceeds entered values.

less than - the event, regardless of alarm or warning, is triggered if the measured value falls below configured values.

greater than - the event, regardless of alarm or warning, is triggered if measured value exceeds configured values.

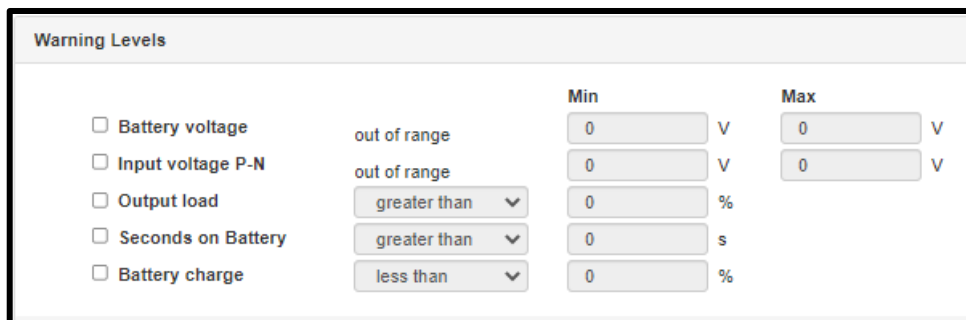
7.2 Example of how to Configure a Custom Threshold

The CS141 can be configured to warn if these values will be exceeded. This example describes how to alarm on an Output Load condition. To prevent the UPS from going into an overload condition, you want to be notified if the Output Load is greater than 100%. The condition out of range first defines the Output Load to be notified at.

As mentioned, two menus are required to configure Custom Thresholds:

Custom Thresholds

The first setting is made under Custom Thresholds where the appropriate values are set.



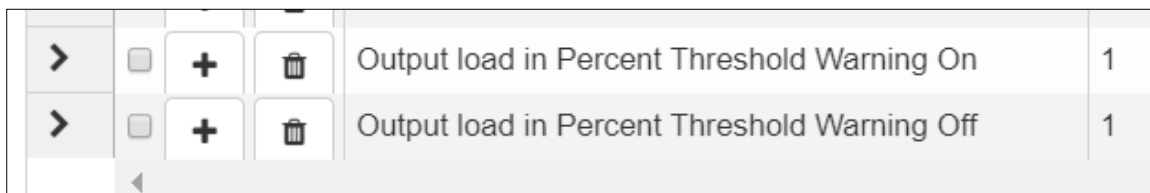
		Min	Max
<input type="checkbox"/> Battery voltage	out of range	0 V	0 V
<input type="checkbox"/> Input voltage P-N	out of range	0 V	0 V
<input checked="" type="checkbox"/> Output load	greater than	0 %	
<input type="checkbox"/> Seconds on Battery	greater than	0 s	
<input type="checkbox"/> Battery charge	less than	0 %	

Enabling the checkbox Output Load will turn on the warning level for the UPS Output Load. For the argument you need to specify less/greater than and the output load.

Save your entries and move to the next menu.

UPS Events

Search for temperature threshold entries to be found at UPS events. Unlike the Custom Thresholds menu each Threshold is displayed as regular system events and shows all possible states.



>	<input type="checkbox"/>	+	🗑️	Output load in Percent Threshold Warning On	1
>	<input type="checkbox"/>	+	🗑️	Output load in Percent Threshold Warning Off	1

Since Custom Thresholds can be configured like regular UPS events all jobs are available. If necessary, counter jobs can be defined according to temperature.

Setting up Alarm Levels

The alarm levels represent an escalation level and, if necessary, should trigger emergency measures. The values must be adjusted accordingly to warning levels.

>	<input type="checkbox"/>	+	🗑️	Output load in Percent Threshold Alarm On	1	1
>	<input type="checkbox"/>	+	🗑️	Output load in Percent Threshold Alarm Off	1	1

Please note since the condition for an alarm is fulfilled in addition to existing warning levels configured jobs can be executed in parallel, overlap, or even contradict or cancel each other out.

7.3 Custom Thresholds Available

The below shows the custom threshold list that is available.

		Min		Max
<input type="checkbox"/> Battery voltage	out of range	<input type="text" value="0"/>	V	<input type="text" value="0"/> V
<input type="checkbox"/> Input voltage P-N	out of range	<input type="text" value="0"/>	V	<input type="text" value="0"/> V
<input type="checkbox"/> Output load	greater than ▼	<input type="text" value="0"/>	%	
<input type="checkbox"/> Seconds on Battery	greater than ▼	<input type="text" value="0"/>	s	
<input type="checkbox"/> Battery charge	less than ▼	<input type="text" value="0"/>	%	

Battery Voltage out of range XX V – XX V

Batteries are sensitive to voltages. High voltages and deep discharges can permanently damage them. This value can be used to warn you in time if the entered range is left.

Input voltage P-N out of range XX V – XX V

This value can be used to implement an alarm response to voltage dips or overvoltage on the main power input.

Battery Charge XXX than XX %

If a UPS comes back from autonomous operation to normal mode it will automatically start to recharge the batteries. This may last some time. In the case of several short power failures in sequence an additional early warning behavior can be defined using this value.

Output Load XXX than XX %

This value can be used to implement a warning or alarm response to the output load conditions.

Seconds on Battery XXX than XX s

This value can be used to implement a warning or alarm response to the amount of time on battery.

Note: Pay close attention to the arguments associated with the thresholds:

Greater than, less than, in range, out of range arguments are taken literally as a condition. The warning and alarm behavior will be done according to the configuration:

As an example, if the output load warning is less than 67% it will also issue a warning if it drops to 43%.

On the other hand, 67% will not warn due to the fact the value has to be below 67%

8. CS141 RCCMD Server

RCCMD (Remote Console Command) is a shutdown solution for heterogeneous networks and can initiate multiple messages and shutdown sequences. The CS141 has a built-in RCCMD Server.

The RCCMD clients listen on port 6003 for incoming messages from the RCCMD server module.

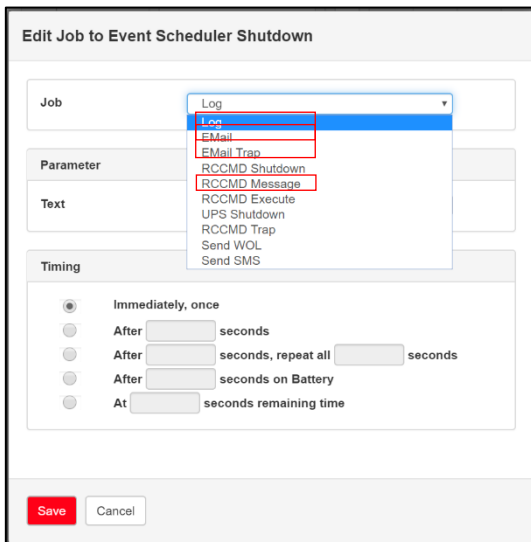
An RCCMD server controls the RCCMD clients network. The functional scope ranges from monitoring, notifications up to a structured shutdown of multiple server environments. RCCMD even considers mutual dependencies.

Note: The RCCMD client is a licensed piece of software.

A separate license is available and can be obtained from Mitsubishi Electric Power Products Inc.

8.1 Available RCCMD Commands

The RCCMD commands are defined as jobs via the system events. There are four different categories available:



→ **RCCMD Shutdown:** The RCCMD shutdown sends a signal to an RCCMD client. The RCCMD client tells the server to initiate its shutdown sequence.

→ **RCCMD Message:** An RCCMD message is a notification that can be sent to an RCCMD receiver. This text will be displayed on the screen using a separate message box.

→ **RCCMD Execute:** If scripts have to be executed in advance for a shutdown, they can be triggered by using the execute command. RCCMD offers not only ready-made commands but also the possibility to start own scripts.

→ **RCCMD Trap:** Trap messages are pure informational messages that can be sent to RCCMD clients. The client receives these text messages and displays them inside a pop-up message box.

Note: An initiated RCCMD shutdown cannot be withdrawn. However, within the RCCMD client you can also define redundancies and limit IP addresses that are authorized to send an RCCMD signals.

RCCMB Shutdown

The RCCMD shutdown is predefined and advises the addressed RCCMD client to shut down the operating system and turn off the device. Configurable options include broadcast, sending to individual IP addresses and the port used for RCCMD.

Parameter	
IP	<input type="checkbox"/> Broadcast 192.168.3.1
Port	6003

RCCMD Message

The RCCMD message is a text message that can be defined freely. The text box automatically shifts with the entered text as soon as you reach the right margin. This message will appear as an alert on any computer the RCCMD client is installed and configured on. RCCMD also displays a warning box on the taskbar.

Parameter	
Text	Message
IP	<input checked="" type="checkbox"/> Broadcast 127.0.0.1
Port	6003

RCCMD Execute

An extensive feature within RCCMD is the possibility to run own executables and batch files on a target computer. This function is useful if scripts have to be executed right before a shutdown is triggered. It is necessary to move the file to be executed to the installation directory of the RCCMD client. Afterwards the CS141 signals to execute this script directly.

Parameter	
IP	<input type="checkbox"/> Broadcast 127.0.0.1
Port	6003
Command	Command

8.2 Configure a RCCMD Job

RCCMD uses IP addressing to communicate within a network as well as a single network segment. The following parameters can be adjusted

Add Job to Event Powerfail

Job RCCMD Shutdown

Parameter

Host Broadcast

Port

Timing

Immediately, once

After seconds

After seconds, repeat all seconds

After seconds on Battery

At seconds remaining time

Save
Cancel

- Job selection
- Send broadcast message
- IP address of a client
- Configured port to be used
- Job timing
- Save settings / cancel configuration

8.3 Setting up the IP Address for RCCMD

Broadcast messages

Activating this checkbox will trigger an RCCMD broadcast job for that event. Each RCCMD client installed on this network segment is addressed and responds by shutting down and turning off the computer. There is no distinction between host, virtual machine, single server or workstation.

Limiting IP addressing

A broadcast message is not always the best method for shutting down networks. To address a particular machine within your network, enter the IP address of the device. In fact, only addressed computers, physical or virtual devices, will receive the RCCMD message.

The CS141 provides the ability to create a single job for each RCCMD client as well as combining several IP addresses to create a device group job.

Parameter	
IP	<input type="checkbox"/> Broadcast 192.168.3.1
Port	6003

... One job, one IP address ...

Parameter	
IP	<input type="checkbox"/> Broadcast 192.168.3.1,192.168.3.18,195.168.3.45
Port	6003

... several IP addresses to configure a group job.

For several IP addresses please ensure the correct syntax:

192.168.3.1,192.168.3.18, ...

The IP addresses should be written without space between the individual entries. Otherwise you will receive a corresponding error message.

Note: Broadcast messages and individual IP addressed or collective addressed messages are mutually exclusive. You can configure the RCCMD client to accept commands by single IP addresses. But the client cannot be configured to differ between a broadcast message and a single message. If you want to shut down devices and device groups first and then send a broadcast, you need to create several jobs with a corresponding time delay.

Port Selection

The default port RCCMD uses port 6003. The RCCMD client is listening on this port for a valid RCCMD command.

If your RCCMD client has been assigned a different port during installation and configuration, ensure sender and receiver are using the same ports.

Parameter	
IP	<input type="checkbox"/> Broadcast 192.168.3.1
Port	6003

8.4 RCCMD Job Timing

The CS141 provides many system events a job can be assigned to. Some jobs allow you to configure advanced timing.

Timing	
<input checked="" type="radio"/>	Immediately, once
<input type="radio"/>	After <input type="text"/> seconds
<input type="radio"/>	After <input type="text"/> seconds, repeat all <input type="text"/> seconds
<input type="radio"/>	After <input type="text"/> seconds on Battery
<input type="radio"/>	At <input type="text"/> seconds remaining time

Immediately, once

As soon as an event happens this job is executed at once and not repeated.

After XXX seconds

The CS141 will wait a pre-defined time in seconds and then execute the job. If the event is no longer active before time is up, the job will not be executed.

Repeat all XXX seconds

The job is repeated cyclically until the event is no longer active.

After XXX seconds on battery

The job will be executed if the UPS remains in this state for a pre-defined time. For example, if 300 seconds are set this job will only be executed if the UPS operates in autonomous mode for 300 seconds.

8.5 RCCMD Traps

RCCMD traps are data packets designed to inform about the current state of the UPS.

A data package is generated, which can be received, read out and interpreted by a corresponding software or device.

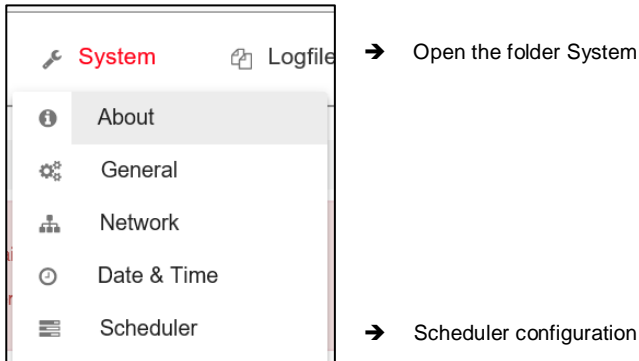
The following list contains possible variables that you can use to define RCCMD traps:

#AGENTSOFTRREV	- CS141 Firmware Version
#AUTONOMTIME	- Autonomy time in minutes
#BATT2OLD()	- Time in months until event "Please check batteries" is triggered
#BATT2OLD_YEARS	- Battery age in years
#BATTCAP	- Battery capacity in %
#BATTINSTDATE	- Installation date of the battery
#BATTTESTDATE	- Date of the last battery test
#BATTVOLT	- Battery voltage in V
#CHARGECURR	- Momentary loading current
#CNT_BL	- Counter battery low
#CNT_PF	- Counter Powerfail
#CNT_SA	- Counter active shutdowns
#CNT_SD	- Counter shutdowns
#CNT_TF	- Counter testing failure
#DATE	- Current date
#EVENTSTATE	- obstatus (idle, error, progress, success)
#HOLDTIME	- Hold time at 100 % load
#IDENT_NAME	- Name of the SNMP adapter
#INCURR0/1/2	- Input current in A (per phase 0,1,2)
#INPUTCURRENT0/1/2	- Input current in A (per phase 0,1,2)
#INFREQ0/1/2	- Input frequency in Hz (per phase 0,1,2)
#INPHASES	- Number of input phases
#INVOLT0/1/2	- Input voltage in V (per phase 0,1,2)
#LASTERR	- Last error
#LOAD	- Current load
#LOCATION	- Device location
#MANUFACTURER	- Manufacturer of the UPS
#MODEL	- UPS model
#OUTFREQ0/1/2	- Output frequency in Hz (per phase 0,1,2)
#OUTPHASES	- Output number of phases
#OUTPOWER0/1/2	- Output power (per phase 0,1,2)
#OUTPUT_VOLT0/1/2	- Output voltage in V (per phase 0,1,2)
#OUTPUTCURRENT0/1/2	- Output current in A (per phase 0,1,2)

#OVERLOAD	- Overload
#PHASES	- Number of phases
#POWER	- Output power of the UPS
#RUNTIME	- Uptime since last commissioning
#SECONBAT()	- Seconds on battery
#SERVER	- IP address of the SNMP manager
#STATUS	- System state
#SYSDATE()	- System date
#SYSTIME()	- System time
#TIMEZONE	- Time zone

9. Scheduler

The scheduler can be accessed by navigating to the following menu.



Regardless of all system events the CS141 offers the possibility to run jobs at configurable times.

These so-called scheduled jobs can be used, for example, to send alerts, to shutdown computers, etc.

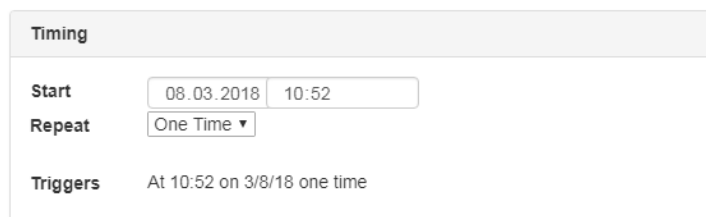
Configuration menu for scheduled jobs

There are no factory default configurations defined. They need to be defined by administrators or engineers

Press + to start the scheduled task configuration dialog



The job configuration dialog is similar to the UPS event job configuration dialog. Timing configuration differs due to the fact these jobs have to be triggered independently to UPS alarm states.



Start

Enter the date and time the job will be executed for the first time.

Repeat

Toggles the job repeating behavior.










The following values are valid:

- One Time - Only once at the specified system time
- Daily - Every day depending on system time
- Weekly - Once a week depending on system time
- Monthly - Once a month depending on system time

10. Webserver

10.1 Webserver Settings

The webserver settings can be accessed by navigating to the following menu.

 Services	→	Open the folder Services
 Setup	→	Basic setup configuration
 Email		
 Email-Traps		
 SNMP Agent		
 Modbus		
 BACnet		
 RCCMD		
 Webserver	→	Web server configuration

Note: If possible do not disable the web server!

In order to adhere to some high security conditions, it may be desirable that the web interface of CS141 be switched off after configuration work. The CS141 will continue to operate as normal, however the webserver will no longer be available to make setting changes.

For security reasons there is no console access. Configuration work must be done via the web interface.

Services > Webserver		
HTTP Port	<input type="text" value="80"/>	→ Define the port for HTTP access
HTTPS Port	<input type="text" value="443"/>	→ Define the port for HTTPS access
Force HTTPS	<input type="checkbox"/>	→ Deny HTTP access / HTTPS access only
HTTP Refresh Time	<input type="text" value="10"/>	→ Refresh time of the web server in seconds
HTTP Default Page	<input type="text" value="UPS Monitor"/> <input type="checkbox"/> use Simple Monitor	→ Select start page after login
Enable HTTP Tooltips	<input checked="" type="checkbox"/>	→ Enable / disable the Tooltip
Automatic Logout		
After	<input type="text" value="15"/> min <input type="checkbox"/> No Auto Logout	→ Automatic logout function
<input type="button" value="Apply"/> <input type="button" value="Cancel"/>		→ Save settings / cancel configuration

HTTP Port

The international standard for web access is port 80 and normally this port does not have to be changed. If your IT infrastructure uses a setting that differs you may change this setting to fit to your port number.

Please note if you use a custom port setting you need to name the according port for web access.

192.168.3.1:85

In this example, the CS141 will only be accessible at the IP 192.168.3.1 and the port 85. With port 80 you would run into an error message that is generated by your web browser.

HTTPs Port

In case of using HTTPs the standard port is port 443. Like the HTTP port you may use this setting to define custom ports for HTTPs access.

Force HTTPs

When selected this prevents regular HTTP traffic and enforces the use of HTTPs encrypted traffic.

As soon as force https is active, https:// is mandatory for a direct web access to the CS141.

HTTP Refresh Time

The CS141 dynamically updates the system status page and by default is set to refresh this screen every 10 seconds. This setting allows you to choose your own refresh time.

HTTP Default Page

Select the default page that opens when accessing the CS141.

If you plan on accessing the CS141 frequently from a device with a small screen you can enable the Use Simple Monitor option.

Enable HTTP Tool Tips

Tooltips are context related pop up screens that appear automatically as soon as you move the mouse over a setting option. As a default the tooltips are enabled. Unchecking this box will disable the tooltips.

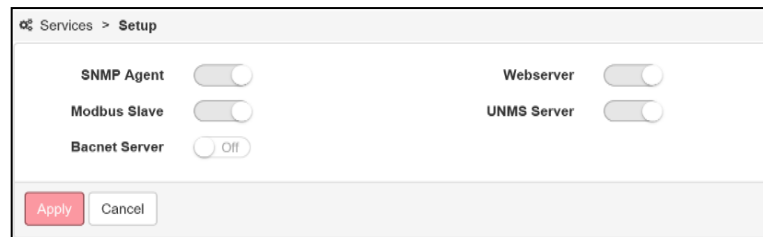
Automatic Logout

Set the time for the CS141 to automatically log the user out after no activity or disable automatic logout all together.

10.2 Disabling the Webserver

Within Services>Setup, the CS141 provides functions to disable the built-in webserver service.

Please note that the complete user interface is linked to the web server. After disabling the webserver, you cannot carry out any further configuration or access the monitoring screens. For access of the user interface resetting the device to factory defaults is mandatory.



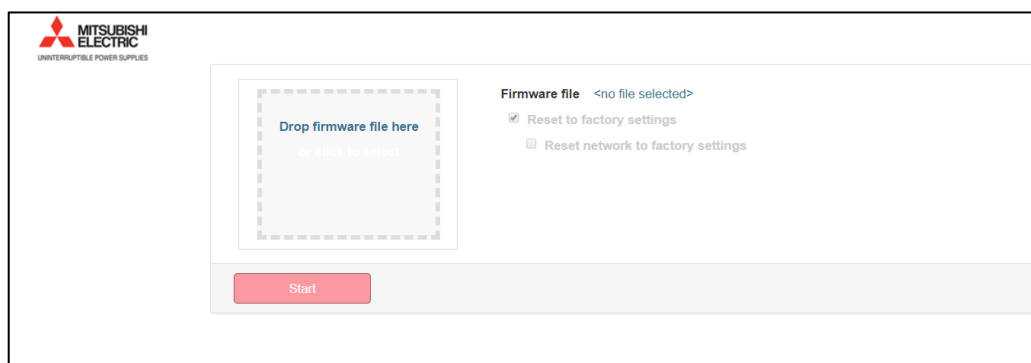
10.3 Recovering the Webserver

After switching off the web server you can no longer change the configuration. If you do not have a backup of your configuration you will have to completely reconfigure the CS141 after resetting the configuration.

Even with the web server disabled some functions will still work. One of these functions is the direct call of the update window.

In your web browser enter the following address.

HTTP(s)://<your IP address>/update



Select the check box for Reset to Factory Settings and hit next. This will delete the basic device configuration but keep the network settings.

After flashing the CS141 will restart and the web interface is available. Open System>Backup and use the drag and drop to place and load the backup file.

Note: If your backup file has the webserver disabled in the options this will also restore that setting and you will not be able to access the user interface.

11. Diagnostic Status

The CS141 offers several options for diagnosis. The fastest method is a quick visual inspection of the LEDs. To perform a quick inspection, take a look at the two LEDs on the front of the CS141.

Green LED	Red LED	Adapter
OFF	OFF	No Power
OFF	ON	Boot in progress
OFF	SLOW BLINKING	Update in progress
OFF	FAST BLINKING	Update failure
ON	ON	Communication lost
SLOW BLINKING	OFF	Everything is OK

After logging in the CS141 will display a more detailed overview of the current system state:



A green marker indicates communication without problems.

Please note when no UPS device is selected the CS141 will show a dummy screen and the LED will also be green.



A yellow marker is displayed if:

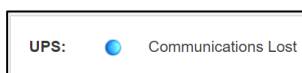
The device will initialize and the communication is being established

There is a warning behavior. It might be required appropriate intervention in the near future.



If the LED is red an alarm or critical condition is currently detected.

The type of the alarm is displayed in detail.



A blue marker indicates that the device was probably configured correctly but no initial communication has been established.

12. Logfiles

12.1 Event Log

To access the event log, navigate to the following menu.



The event log is where all events concerning the CS141 and the UPS are recorded. The event history will be written with any event containing a log job. The most significant jobs are included by default settings. Administrators may create, edit, and delete default settings as well as creating custom log entries.

Logtime	Logtext
<input type="text" value="Logtime search"/>	<input type="text" value="Logtext search ..."/>
12/07/2017,09:38:01	time synchronization job : OK
12/07/2017,09:38:01	Restart NTP service: OK
12/07/2017,09:33:45	UPSMAN on No UPS model defined has started
12/07/2017,09:33:25	CS141L V1.63 - OEM 32

[Download als CSV Datei](#)

After reboot the first entry is a message by CS141 with its ID.

12/07/2017,09:33:25	CS141L V1.63 - OEM 32
---------------------	-----------------------

Please note the latest entry is always on top of the list.

Download as CSV file creates a CSV file from this event log and stores it locally on your hard disk.

DataLog	04.10.2017 13:45	Microsoft Excel-C...	400 KB
eventlog	07.12.2017 10:45	Microsoft Excel-C...	1 KB

Any program that can deal with CSV files can be used to open the event log.

A12			
		fx	
	A	B	
1	12/07/2017,09:33:25, CS141L V1.63 - OEM 32		
2	12/07/2017,09:33:45, UPSMAN on No UPS model defined has started		
3	12/07/2017,09:38:01, Restart NTP service: OK		
4	12/07/2017,09:38:01, time synchronization job : OK		
5			
6			

In case the event log memory is full the CS141 will open an archive file and move the current event log. This archive file will be provided for both downloading as well as instant view.

Note: Depending on the configuration the system events in the event log are kept for up to three months. As soon as the running memory for the current event log file is full the files are stored alternately in up to two archive files. This generally provides a monitored period of up to 9 months from initial startup.

Navigate between log files

By default, the current event log is displayed. Administrators are able to toggle between the two logs by clicking the button "Show archived Logfiles" in the upper right corner.

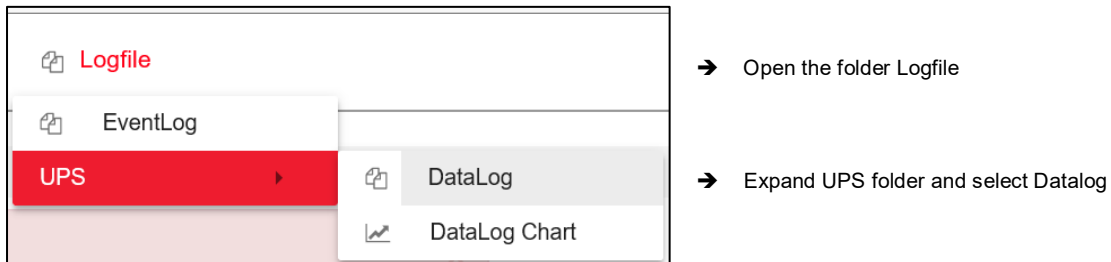
Show archived Logfiles

By doing so the label of this button will change. To return to the active log file press the button now labeled "Show active log file".

Show active Logfile

12.2 Data Log

To access the data log navigate to the following menu.



The data log recognizes the measurement data of the UPS.

Due to the fact these are provided with a time stamp, they can be combined with the event log and analysts can build event chains with additional UPS data.

Like the event log, the data log can be exported as CSV file as data backup. The data log stores the entries every 3 minutes and keeps the entries 8 weeks as the current data log file. After that the actual data log will be moved to an archive file and a new data log for the current data is opened.

[Export to CSV](#)

The CS141 provides for storing up to 2 independent archive files.

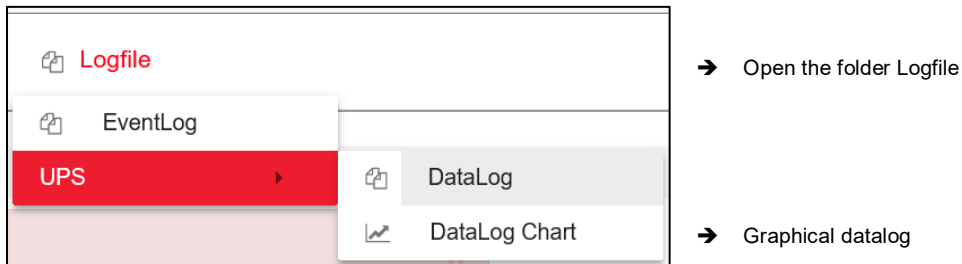
In addition to the current period there are up to 24 weeks available. After that time the oldest archive file is replaced.

As with the event log, administrators can toggle between active log and achieved log files.

Note: The UPS Event Recorder polls the current list from the UPS with each call. These log data will not be cached or saved by CS141.

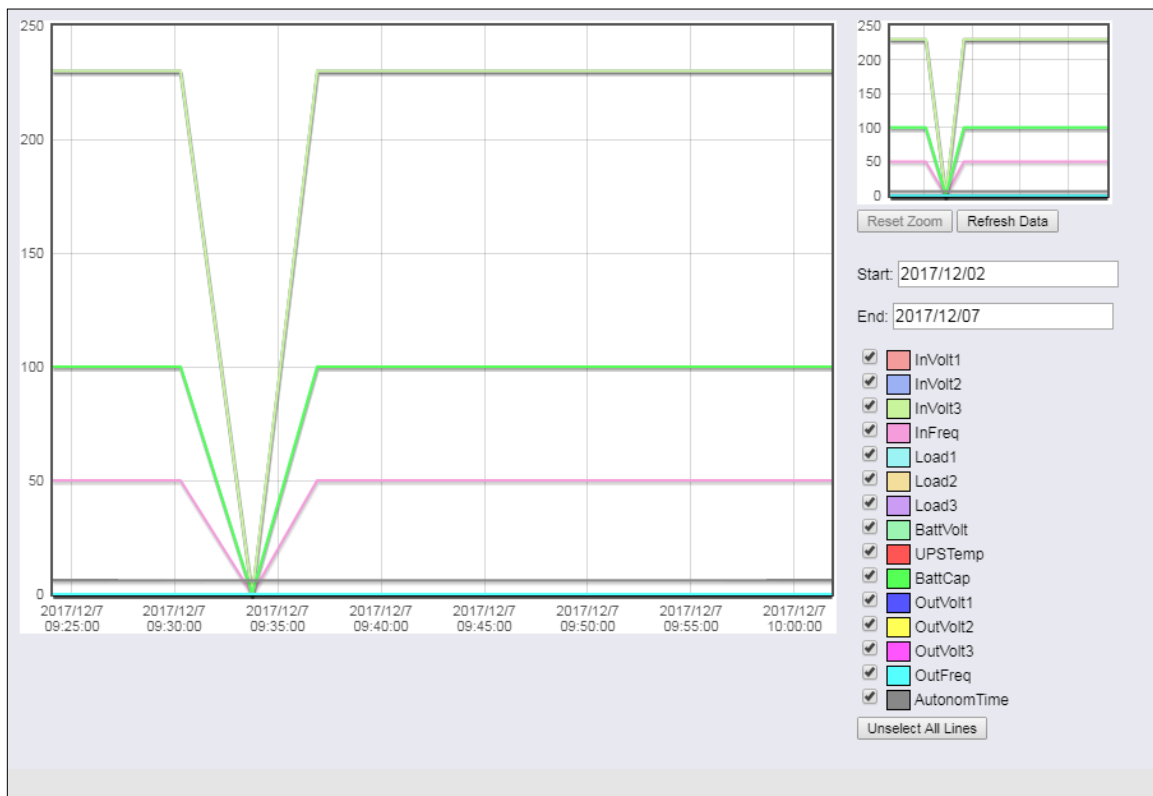
12.3 Data Log Diagram

To access the data log chart, navigate to the following menu.



With data log chart the CS141 provides a graphical presentation of the history.

This feature allows you to examine all entries within the data log exclusively. Single entries can be selected by using checkboxes.

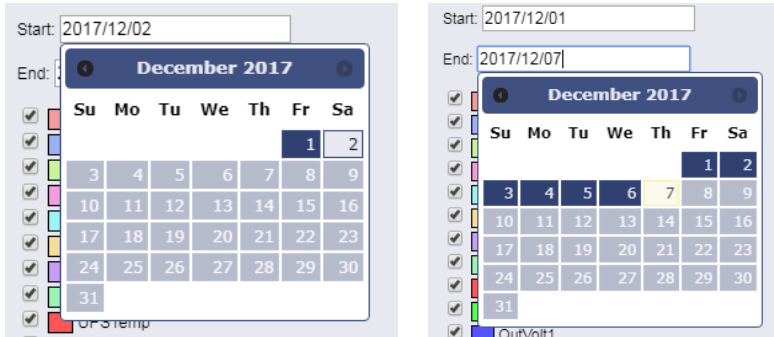


In addition to the current values the CS141 provides selecting specific values from current databases.

As a default all check marks are set when called. You can use the Unselect All Lines function to remove them and set the relevant checkmarks.

How to use the calendar

The calendar feature provides a quick overview of existing time periods that are selectable. Click the date field to bring up the calendar.

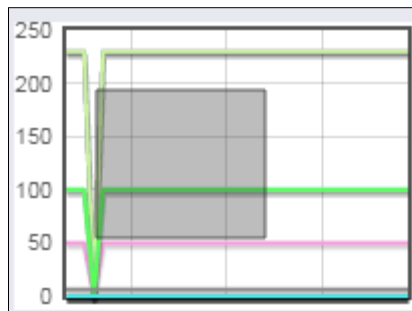


The dates of the corresponding period are automatically loaded and displayed inside the main window.

Zoom the chart

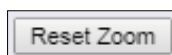
The CS141 has the ability of zooming in on the data to obtain a detailed view within the displayed measurement data.

To refine the display, drag a frame inside the small window. The main window will automatically show a detailed view and provide a customized timeline.

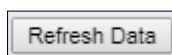


The zoom function allows the user 2X zoom on the graph elements.

To reset the zoom back to the original, click the Reset Zoom button.



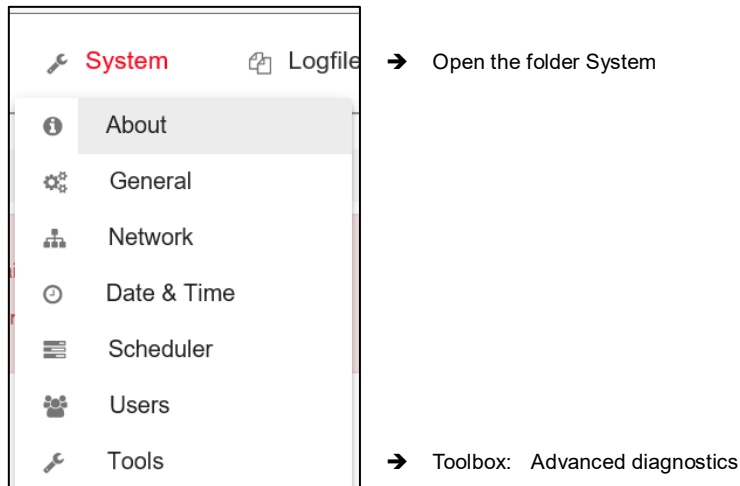
To update the current data shown and refocus the timeline click the Refresh Data button.



13. Tools

The tools are a collection of useful utilities to help in case of diagnostic problems. To ensure authorized access only this menu requires administrative credentials.

To access the tools navigate to the following menu.

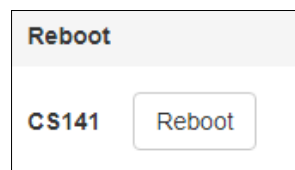


13.1 Reboot

Due to the fact the CS141 accept changes inside the configuration and starts or restarts the corresponding system services in real time a complete restart is an exceptional situation.

A reboot of the CS141 does not affect the UPS.

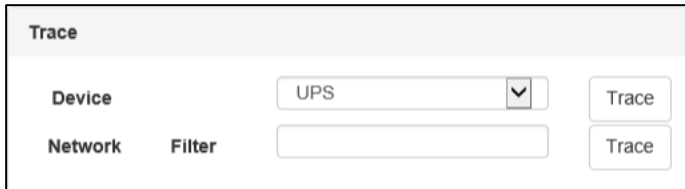
To prevent an accidental triggered reboot this feature was deliberately placed inside Tools.



13.2 Tracer

The Tracer is a comprehensive diagnostic tool for verifying communication between the CS141 and the connected devices as well as for identifying network problems.

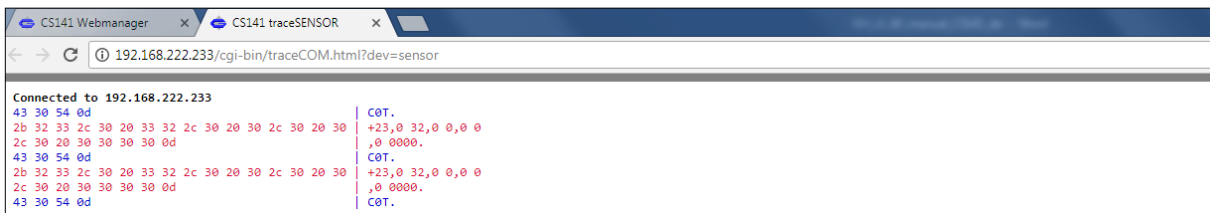
To track a device, open the context menu and select the device you want to monitor. As the screenshot illustrates the CS141 provides COM 1 / UPS



COM 1/UPS

The tracer will screen the current communication running at the serial RS232 port. Faults or faulty communication are displayed in real time and can be saved for later evaluation.

The button labeled with Trace starts the process. Depending on your browser's configuration a new tab will be opened to show the data stream of the communication between the device and the CS141.



The trace ends automatically by closing this tab. Please note that the data will be discarded. To save the data select it with the left mouse button and copy the content with CTRL + C, and insert the information with CTRL + V to a text file.

Available tracing tool control options

- Clear trace log - Deletes the current display. The information cannot be recovered afterwards.
- Save trace log - This will transfer the current browser content into a standard text file.

Note: The telemetry data file is placed in real time inside the memory of the web browser. By closing this window, the trace data file is automatically terminated and lost. Ensure saving data before closing the window of the web browser.

13.3 Network Scan

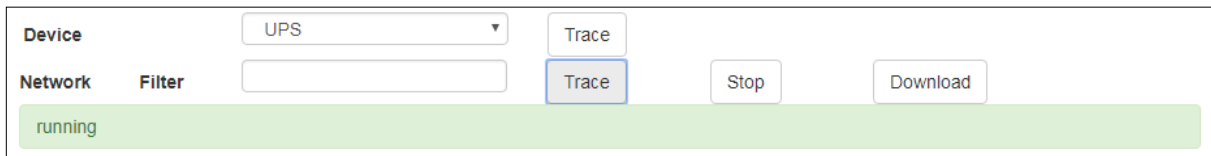
As special feature the CS141 provides is an integrated network scanner to examine the LAN for issues and errors. The network scan provides extensive information for evaluation about the network the CS141 is connected to. All data packets are collected in a log file. After a network scan the network log can be downloaded for evaluation.

Note: Since the network scan records all traffic in the network segment the CS141 is connected to an evaluation with a corresponding network tool can be used to find errors.

Furthermore, extensive insight into the network traffic are available, e.g. to log the user behavior.

Technicians should inform the responsible person before use of the network scan tool.

To perform a network scan, click on the Trace button in the Network line. The tracer will confirm tracing activity with a status bar.



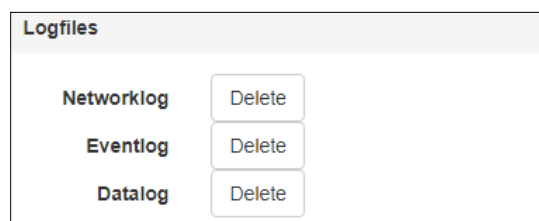
The Tracer logs packet data within the LAN segment in real-time and stores it locally on the CS141. The tracer can be stopped by either pressing the stop button or rebooting the CS141.

After finishing the data will be downloaded in the form of a packed archive for later evaluation.

13.4 Delete Log Files

The CS141 collects and logs a large amount of data and uses non-volatile memory to store it. This data can then be retrieved via a web browser or evaluated by diagnostic tools. Since the log files may contain very sensitive information about a network state it is recommended to delete all data before re-using the CS141.

You can select which type of log to delete individually.



Note: Once deleted, the log files are permanently erased. Normally the CS141 provides enough space to store the data of a complete lifetime cycles. If in doubt ensure a backup of the data files is available.

Please note, there is no option to recover data on the device itself.

13.4.1 Complete Data Deletion

The exact data collected by the CS141 depends on the hardware connected to it as well as its configuration. However, as this data may contain both very sensitive information about the security of the IT infrastructure and a complete chain of events, complete data deletion is recommended.

Where are log files stored?

The log files can be found in two places.

- In regular operating mode - The current log files are created in real time and managed accordingly. If you intentionally delete these files via the toolbox they are lost and data recovery is not possible
- In rescue mode - As soon as you perform a system update in any form the existing data and configurations are stored in the Rescue Mode as "last known good". The regular operating mode is set back to initial state and starts after a successful flashing with a new set of log files. Due to this fact the CS141 provides even an emergency data rescue option. After an accidental flash the rescue mode will allow to access log files as well as the last existing configuration since the previous planned firmware flash.

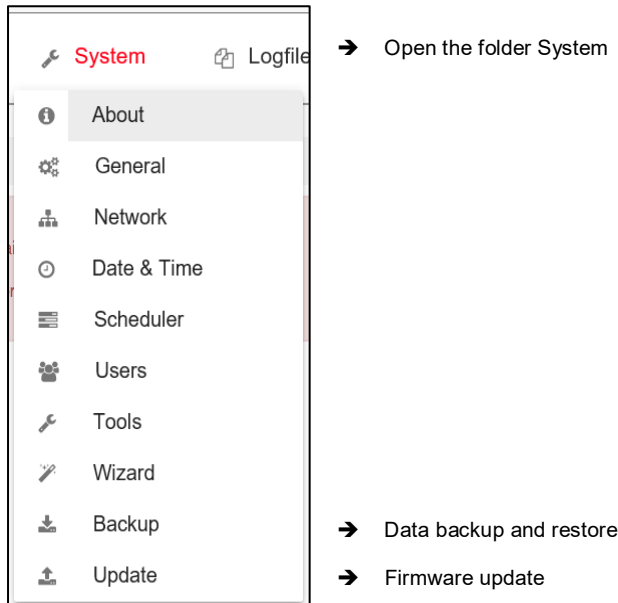
Complete removal of all data

To completely erase all data first set the slide switch to the center position to enable the configuration mode and its hard-coded IP address of 10.10.10.10 and the subnet mask of 255.255.255.0. Make sure that you have assigned a suitable IP address to your computer or enter a corresponding route to access the CS141. Carry out two flash updates in a row and ensure both the checkboxes are selected: Factory default and network reset.

The first flash update transfers data and configuration from the regular operating mode to the Rescue mode and deletes all data during the subsequent flash process. The second flash update transfers the completely empty configuration from the configuration mode to the rescue mode.

14. Data Backup and Firmware Update

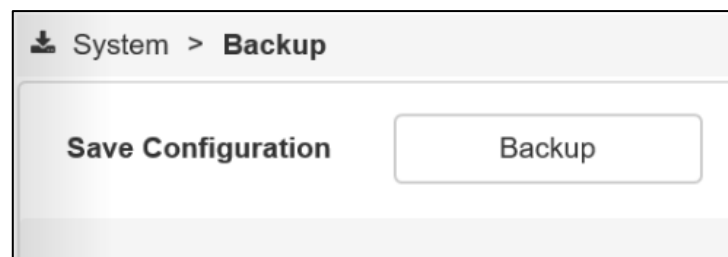
Data backup and firmware updates can be accessed by navigating to the following menu.



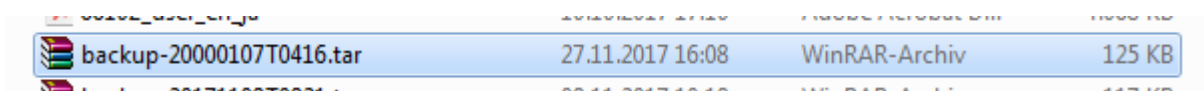
Data backup offers the option to completely back up the current system configuration in order to quickly perform a recovery if required. The backup and restore is done in two steps.

14.1 Perform a Backup

Open backup



Under Save Configuration click backup to locally save a backup file to your computer. Since the backup function is system critical the CS141 asks for the valid administrator password.



Please note that renaming the backup file is subject to some restrictions that may lead into an invalid restore procedure.

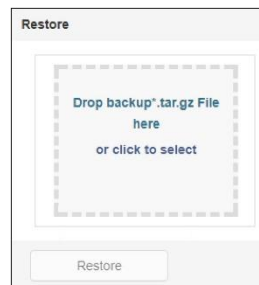
For changing the name of the backup file please note the following:

backup-200001707T0416.tar.gz

- You need the packed file as downloaded
- The area marked in red cannot be changed
- No spaces inside the file name
- No special characters

14.2 Restore the Configuration From a Backup File

Importing a backup file is in the same location as the when performing a backup.



Use drag & drop to place the packed file into the box or left click on the box to open a file browser and double-click on the desired backup file. With Restore, the recovery process will be triggered. During the recovery process the CS141 unpacks the file and automatically takes over as a current configuration. After completing the process, you will automatically be logged out and have to re-login with credentials according to the backup.

14.3 Restore Network Data

Restore network settings

If you back up multiple identically configured CS141s you can exclude IP address settings from recovery. By doing this previously configured IP address entries will remain while restoring all other configurations.

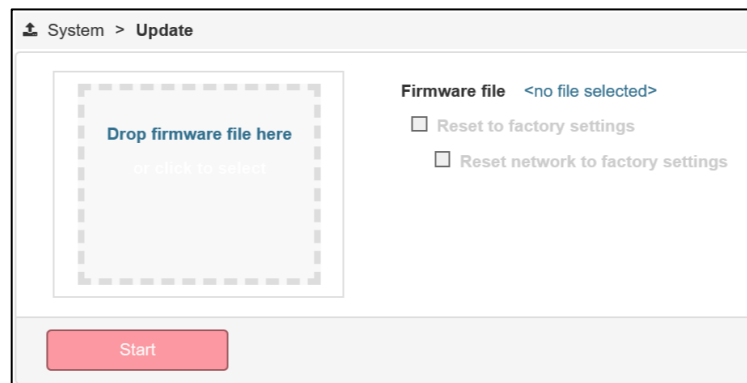
Please note that backups from a CS141 are compatible with any CS141 of the same or later firmware. If you use the backup on a CS141 with an older firmware, problems may arise. This behavior is due to general improvements as well as new features included in the new firmware that older firmware versions cannot work with properly. In some cases, it is possible the backup does not work.

14.4 Firmware Updates

Updated firmware is only available from Mitsubishi Electric Power Products, Inc. and should be performed by a qualified service technician.

Note: Firmware update files do not need unpacked.

To access the firmware update menu, select the System menu and then Update.



Drag the update file directly to the provided window. Selecting Start will trigger the update process.

Before triggering the update with Start button you can select the following additional options:

- | | |
|---|--|
| Reset to factory settings - | This option deletes all configurations during the update and returns the device to the delivery state. |
| Reset the network to factory settings - | This option also resets the network and IP settings to factory defaults. |

Note: These two options are independent to each other to ensure not losing the IP settings. Due to this a factory reset using remote access to the CS141 is possible. Please note reset network to factory settings needs to be de-selected if the CS141 needs to keep its IP settings.

The update is interactive so please remain on the page until you are prompted to restart the device.

Under system open the about menu to check the success of the update.

The current firmware installed will show in the left side panel once logged into the CS141.



14.5 Recovery of the System

The CS141 comes with two possible options if a problem causes a need to reinitialize the firmware or reset the device to factory defaults.

14.5.1 Interface is Available

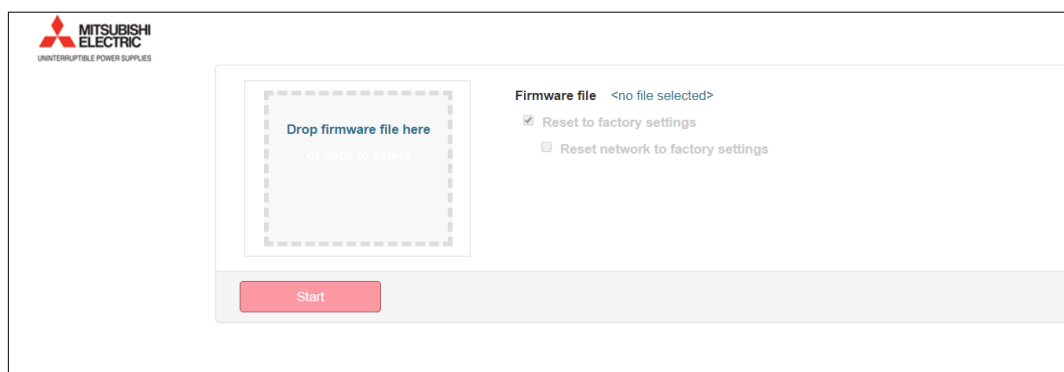
If the CS141 does not allow a login or the interface shows a faulty display but still can be reached regularly administrators may try the following:

[http:// <IP address> / reboot](http://<IP address>/reboot)

This option allows you to force a restart of the CS141 directly.

[http:// <IP address> / update](http://<IP address>/update)

This option takes administrators directly to the update screen without the need for logging in.



From here you can select the desired firmware package by drag & drop or by clicking the button. Please note that this function is a rescue system, the CS141 will reset all settings except the IP address. All configurations are deleted and the device is set to startup configuration.

Enter the password for the administrator account if you are not in configuration mode.

The process starts and after successful flashing the standard login screen will be shown.

Note: If you have lost the administrator password move the sliding switch to the center position. After cold boot it is possible to flash the device directly. Enter the following line in your web browser:

`http://10.10.10.10/update`

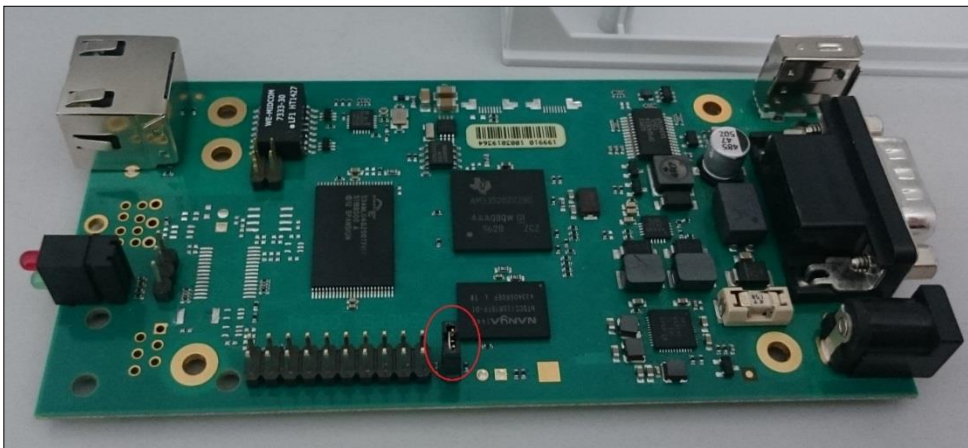
The administrative password will be set to default setting.

14.5.2 Rescue System

If the web interface is not available the CS141 offers second option.

During flashing the CS141 saves a complete backup including the configuration of the “last known: good”.

This version can be activated by setting the following jumper:



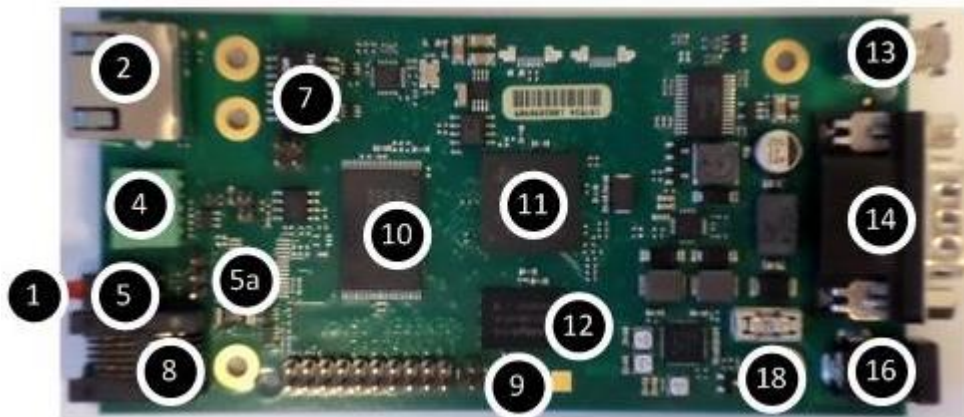
If the jumper is set and the adapter boots the CS141 will run this version as a rescue system based on the last firmware version.

Inside the About menu the firmware version will add the word RESCUE to show its current operational mode

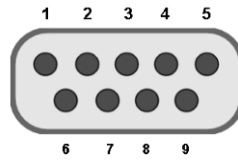
Appendix

A. Hardware Layout of the CS141

1. Slide-Switch for network configuration
2. Network Interface
4. COM2 Phoenix Connector for RS485
5. Green and Red Status LED
7. PoE Header
8. Debug Adapter
9. Rescue Jumper: Open = Normal Boot, Close = Rescue Boot
10. NAND Flash
11. CPU
12. RAM
13. USB Interface
14. COM1
16. Power Supply
18. Fuse



Interface Description



External D-SUB 9- plug male:

Pin1:	DCD	Pin6:	DSR
Pin2:	RxD	Pin7:	RTS
Pin3:	TxD	Pin8:	CTS
Pin4:	DTR	Pin9:	RI
Pin5:	GND		

RS-485:

Pin1:	->	GND
Pin2:	->	RS485/A
Pin3:	->	RS485/B(-)

B. Modbus Addresses

The Modbus registers are as follows for each Mitsubishi UPS unit. This is to allow ease of retrofitting the CS141 in place of the Mitsubishi LookUPS communication board without having to adjust your building management or monitoring software.

B.1 9900AEGIS/B/C/CX/D/SUMMIT Register List

Register Address	Item	R/W	Description	Note
0000-000F	Manufacturer	R	string(32)	
0010-001F	Model	R	string(32)	
0020-002F	Ups Software Version	R	string(32)	
0030-003F	Agent Software Version	R	string(32)	CS141 board software version if possible
0050	Nominal Input Voltage	R	0.1V	
0051	Nominal Input Frequency	R	0.1Hz	
0052	Nominal Output Voltage	R	0.1V	
0053	Nominal Output Frequency	R	0.1Hz	
0054	Nominal Output Capacity	R	0.1kVA	
0055	Nominal Output Power	R	0.1kW	
0056	UPS Communication	R	NOT USED	
0057	Battery Status	R	normal(0), lowbattery(1) ,depleted(2)	
0058	Battery Charge	R	Floating(0), Charging(1) Resting(2), Discharging(3)	
0059	Seconds On Battery	R	second	
005B	Estimated Charge Remaining	R	0.1%	
005C	Battery Voltage	R	0.1V	
005D	Battery Current	R	0.1A	
005F	Input Line Bads	R		
0060	Input Num Lines	R		
0061	Input Frequency	R	0.1Hz	
0062	Input Voltage 1	R	0.1V	
0065	Input Voltage 2	R	0.1V	
0068	Input Voltage 3	R	0.1V	
006B	Output Source	R	inverter(0), battery(1) bypass(2), other(5)	

006C	Output Frequency	R	0.1Hz	
006D	Output Num Lines	R		
006E	Output Voltage 1	R	0.1V	
006F	Output Current 1	R	0.1A	
0070	Output Power 1	R	0.1kW	
0071	Output Percent Load 1	R	0.1%	
0072	Output Voltage 2	R	0.1V	
0073	Output Current 2	R	0.1A	
0074	Synchronous Status	R	inverter off(0) synchronous(1) asynchronous(2)	
0075	Output Percent Load 2	R	0.1%	
0076	Output Voltage 3	R	0.1V	
0077	Output Current 3	R	0.1A	
0079	Output Percent Load 3	R	0.1%	
007E	Load Power Factor	R	NOT USED	
007F	Bypass Frequency	R	0.1Hz	
0080	Bypass Num Lines	R		
0081	Bypass Voltage 1	R	0.1V	
0084	Bypass Voltage 2	R	0.1V	
0087	Bypass Voltage 3	R	0.1V	
008E	Alarm Temperature	R	non active(0),active(1)	
008F	Alarm Input Bad	R	non active(0),active(1)	
0090	Alarm Output Bad	R	non active(0),active(1)	
0091	Alarm Overload	R	non active(0),active(1)	
0092	Alarm Bypass Bad	R	non active(0),active(1)	
0093	Alarm Output Off	R	non active(0),active(1)	
0095	Alarm Charger Failure	R	non active(0),active(1)	
0096	Alarm System Off	R	non active(0),active(1)	
0097	Alarm Fan Failure	R	non active(0),active(1)	
0099	Alarm General Fault	R	non active(0),active(1)	
009A	Alarm Awaiting Power	R	non active(0),active(1)	
009D	Current Alarm Number	R		
009E	Current Alarm Item 1	R	*Refer to Alarm Flag Table	
009F	Current Alarm Item 2	R	*Refer to Alarm Flag Table	
00A0	Current Alarm Item 3	R	*Refer to Alarm Flag Table	
00A1	Current Alarm Item 4	R	*Refer to Alarm Flag Table	
00A2	Current Alarm Item 5	R	*Refer to Alarm Flag Table	
00A3	Current Alarm Item 6	R	*Refer to Alarm Flag Table	
00A4	Current Alarm Item 7	R	*Refer to Alarm Flag Table	
00A5	Current Alarm Item 8	R	*Refer to Alarm Flag Table	
00A6	Current Alarm Item 9	R	*Refer to Alarm Flag Table	
00A7	Current Alarm Item 10	R	*Refer to Alarm Flag Table	

00A8	Failure Flag 1	R	NOT USED	
00A9	Status Flag 1	R	NOT USED	
00AA	Status Flag 2	R	NOT USED	
00AB	Alarm Flag 1	R	*Refer to Alarm Flag Table	
00AC	Alarm Flag 2	R	*Refer to Alarm Flag Table	
00AD	Alarm Flag 3	R	*Refer to Alarm Flag Table	
00AE	Alarm Flag 4	R	*Refer to Alarm Flag Table	
00AF	Alarm Flag 5	R	*Refer to Alarm Flag Table	
00B0	Alarm Flag 6	R	*Refer to Alarm Flag Table	
00B1	Alarm Flag 7	R	*Refer to Alarm Flag Table	
00B2	Alarm Flag 8	R	*Refer to Alarm Flag Table	
00B3	Alarm Flag 9	R	*Refer to Alarm Flag Table	
00B4	Alarm Flag 10	R	*Refer to Alarm Flag Table	
00B5	Alarm Flag 11	R	*Refer to Alarm Flag Table	
00B6	Alarm Flag 12	R	*Refer to Alarm Flag Table	

B.2 9900AEGIS/B Alarm Flag Table

Device	Bit	Failure Code	Display Code	Item
Alarm1	D0			
	D1	2	UF001	INPUT CIRCUIT ABNORMAL
	D2	4	UF002	CONVERTER OVERCURRENT
	D3	6	UF003	CONVERTER ABNORMAL
	D4	8	UF006	CONVERTER ABNORMAL
	D5	10	UF011	CB1 ABNORMAL
	D6	12	UF052	CB1 ABNORMAL
	D7	14	UF055	CONVERTER ABNORMAL
	D8	16	UF056	CONVERTER OVERCURRENT
	D9	18	UF059	INPUT CIRCUIT ABNORMAL
	D10	20	UF102	DC OVERVOLTAGE
	D11	22	UF103	DC UNDERVOLTAGE
	D12	24	UF108	CHOPPER OVERCURRENT
	D13	26	UF109	DC UNBALANCED
	D14	28	UF110	ZERO PHASE OVERCURRENT
D15	30	UF111	UPS CONTROL CIRCUIT ERROR	
Alarm2	D0	32	UF112	DC CIRCUIT ABNORMAL
	D1	34	UF128	CONTROL POWER SUPPLY ABNORMAL
	D2	36	UF119	GROUND FAULT
	D3	38	UF159	GROUND FAULT
	D4	40	UF179	GROUND FAULT
	D5	42	UF151	BATTERY VOLTAGE ABNORMAL
	D6	44	UF152	BATTERY VOLTAGE ABNORMAL
	D7			
	D8	48	UF154	CB2 ABNORMAL
	D9	50	UF156	CHG.STOPPED(BATTERY OVERTEMP.)
	D10	52	UF157	BATTERY OVERTEMPERATURE
	D11	54	UF158	BATTERY LIQUID LOW
	D12	56	UF160	UPS CONTROL CIRCUIT ERROR
	D13	58	UF161	CHG.STOPPED(BATTERY VOLT.ABNL.)
	D14	60	UF162	BATTERY ABNORMAL
D15	62	UF163	BATTERY VOLTAGE ABNORMAL	

Alarm3	D0	64	UF170	VDB SEBSOR ABNORMAL
	D1	66	UF171	UPS CONTROL CIRCUIT ERROR
	D2	68	UF172	CHG.STOPPED(DEVICE STATUS)
	D3	70	UF057	CONVERTER OVERCURRENT
	D4	72	UF201	INVERTER OVERVOLTAGE
	D5	74	UF202	INVERTER UNDERVOLTAGE
	D6	76	UF203	INVERTER OVERCURRENT
	D7	78	UF204	OUTPUT CIRCUIT ABNORMAL
	D8	80	UF206	UPS CONTROL CIRCUIT ERROR
	D9	82	UF207	ZERO PHASE OVERCURRENT
	D10	84	UF208	UPS CONTROL CIRCUIT ERROR
	D11	86	UF209	52C ABNORMAL
	D12	88	UF210	52C ABNORMAL
	D13	90	UF211	52C ABNORMAL
	D14	92	UF004	CONVERTER OVERCURRENT
D15	94	UF214	COOLING FAN ABNORMAL	
Alarm4	D0	96	UF213	OVERTEMPERATURE
	D1	98	UF230	ZERO PHASE OVERCURRENT
	D2	100	UF217	INVERTER OVERVOLTAGE
	D3	102	UF253	UPS CONTROL CIRCUIT ERROR
	D4	104	UF256	OUTPUT VOLTAGE ABNORMAL
	D5	106	UF257	52C ABNORMAL
	D6	108	UF258	LOAD ABNORMAL
	D7	110	UF259	ANOTHER UPS ABNORMAL
	D8	112	UF113	DC CIRCUIT ABNORMAL
	D9	114	UF301	UPS CONTROL CIRCUIT ERROR
	D10	116	UF302	UPS CONTROL CIRCUIT ERROR
	D11	118	UF303	UPS CONTROL CIRCUIT ERROR
	D12	120	UF323	UPS CONTROL CIRCUIT ERROR
	D13	122	UF305	UPS CONTROL CIRCUIT ERROR
	D14	124	UF306	UPS CONTROL CIRCUIT ERROR
D15	126	UF309	INVERTER VOLTAGE ABNORMAL	

Alarm5	D0	128	UF310	CONTROL POWER SUPPLY ABNORMAL
	D1	130	UF320	UPS CONTROL CIRCUIT ERROR
	D2	132	UF331	UPS CONTROL CIRCUIT ERROR
	D3	134	UF332	UPS CONTROL CIRCUIT ERROR
	D4	136	UF333	UPS CONTROL CIRCUIT ERROR
	D5	138	UF334	UPS CONTROL CIRCUIT ERROR
	D6	140	UF352	CONTROL POWER SUPPLY ABNORMAL
	D7	142	UF363	UPS CONTROL CIRCUIT ERROR
	D8	144	UF372	UPS CONTROL CIRCUIT ERROR
	D9	146	UF374	UPS CONTROL CIRCUIT ERROR
	D10	148	UF375	UPS CONTROL CIRCUIT ERROR
	D11	150	UF376	UPS CONTROL CIRCUIT ERROR
	D12	152	UF377	UPS CONTROL CIRCUIT ERROR
	D13	154	UF378	UPS CONTROL CIRCUIT ERROR
	D14	156	UF379	UPS CONTROL CIRCUIT ERROR
D15	158	UF371	UPS CONTROL CIRCUIT ERROR	
Alarm6	D0	160	UF401	52S ABNORMAL
	D1	162	UF402	52S ABNORMAL
	D2	164	UF420	52L OPERATION ERROR
	D3			
	D4	168	UF451	52S ABNORMAL
	D5	170	UF452	CB3 ABNORMAL
	D6			
	D7			
	D8			
	D9			
	D10	180	UA801	AC INPUT VOLTAGE OUT OF RANGE
	D11	182	UA802	AC INPUT FREQUENCY OUT OF RANGE
	D12	184	UA803	AC INPUT PHASE ROTATION ERROR
	D13	186	UA804	CONVERTER OPE. INHIBITED
	D14	188	UA805	INVERTER OVERLOAD
D15	190	UA806	INVERTER OVERLOAD	

Alarm7	D0	192	UA807	INVERTER OVERLOAD
	D1	194	UA808	INVERTER OVERLOAD
	D2			
	D3	198	UA810	INVERTER OVERLOAD
	D4	200	UA870	BALANCER OVERLOAD
	D5	202	UA812	BYPASS VOLTAGE OUT OF RANGE
	D6	204	UA813	BYPASS PHASE ROTATION ERROR
	D7	206	UA814	BYPASS FREQUENCY OUT OF RANGE
	D8	208	UA815	TRANSFER INHIBITED
	D9			
	D10	212	UA817	EMERGENCY STOP ACTIVATED
	D11	214	UA821	TRANSFER INHIBITED
	D12	216	UA822	TRANSFER INHIBITED
	D13	218	UA824	CB2 OPEN
	D14	220	UA827	52C OPERATION INHIBITED
D15	222	UA831	EMERGENCY BYPASS SWITCH ON	
Alarm8	D0			
	D1	226	UA833	52L OPEN
	D2	228	UA834	BATTERY DEPLETED/AC OUT STOPPED
	D3	230	UA835	TRANSFER INHIBITED
	D4	232	UA860	REMOTE BUTTON CLOSE
	D5	234	UA861	LOCAL BUTTON ABNORMAL
	D6	236	UA890	EXTERNAL ALARM
	D7	238	UA841	CONVERTER OPE. INHIBITED
	D8	240	UA828	COOLING FAN ABNORMAL
	D9			
	D10	244	UF380	ESTS CONTROL CIRCUIT ERROR
	D11	246	UF381	ESTS CONTROL CIRCUIT ERROR
	D12			
	D13	250	UF461	OVERTEMPERATURE
	D14	252	UA871	BYPASS VOLTAGE OUT OF RANGE(2)
D15				

B.3 9900C/CX Alarm Flag Table

Device	Bit	Failure Code	Display Code	Item
Alarm 1	D0	805	UA805	OVERLOAD
	D1	806	UA806	INVERTER OVERLOAD
	D2	807	UA807	INVERTER OVERLOAD
	D3	808	UA808	OVERLOAD
	D4	810	UA810	OVERLOAD
	D5	812	UA812	BYPS.VOLT.OUT RNG
	D6	813	UA813	BYPS.PHASE ABNL
	D7	814	UA814	BYPS.FREQ.OUT RNG
	D8	815	UA815	TRANSFER PROHIBITION
	D9	817	UA817	EMERG.STOP ACTIV.
	D10	821	UA821	REM.BUTTON CLOSE
	D11	822	UA822	LOC.BUTTON ABNL.
	D12	824	UA824	CB2 OPEN
	D13	830	UA830	INTERLOCK SWITCH ON
	D14	831	UA831	EMERG.BYPS.SW.ON
D15	833	UA833	52L OPEN	
Alarm 2	D0	834	UA834	BATTERY DEPLETED
	D1	835	UA835	TRANS.INHIBITED
	D2	861	UA861	MODULE ALARM
	D3	862	UA862	MODULE MINOR FAULT
	D4	863	UA863	MOD.IN.VOLT.
	D5	864	UA864	MODULE OVERLOAD
	D6	865	UA865	MOD.BAT.END
	D7	866	UA866	BATT.END WA
	D8	890	UA890	EXTERNAL ALARM
	D9	6	UF006	CONVERTER ABNORMAL
	D10	55	UF055	CONVERTER ABNORMAL
	D11	151	UF151	BAT.VOLTAGE ABNL.
	D12	152	UF152	BAT.VOLTAGE ABNL.
	D13	156	UF156	CHG.STOPPED
	D14	157	UF157	BATTERY OVERTEMP.
D15	158	UF158	BATTERY LIQUID LOW	

Alarm 3	D0	161	UF161	CHG.STOPPED
	D1	162	UF162	BATTERY ABNORMAL
	D2	163	UF163	BAT.VOLTAGE ABNL.
	D3	172	UF172	BATTERY ABNORMAL
	D4	202	UF202	INVERTER UV.
	D5	253	UF253	CTRL.CIRCUIT ERR.
	D6	254	UF254	CTRL.CIRCUIT ERR.
	D7	256	UF256	O/P VOLTAGE ABNL.
	D8	258	UF258	LOAD ABNORMAL
	D9	301	UF301	CTRL.CIRCUIT ERR.
	D10	302	UF302	CTRL.CIRCUIT ERR.
	D11	303	UF303	CTRL.CIRCUIT ERR.
	D12	305	UF305	CTRL.CIRCUIT ERR.
	D13	306	UF306	CTRL.CIRCUIT ERR.
	D14	320	UF320	CTRL.CIRCUIT ERR.
D15	321	UF321	CTRL.CIRCUIT ERR.	
Alarm 4	D0	322	UF322	CTRL.CIRCUIT ERR.
	D1	323	UF323	CTRL.CIRCUIT ERR.
	D2	324	UF324	CTRL.CIRCUIT ERR.
	D3	325	UF325	CTRL.CIRCUIT ERR.
	D4	326	UF326	CTRL.CIRCUIT ERR.
	D5	327	UF327	CTRL.CIRCUIT ERR.
	D6	340	UF340	MODULE MINOR FAULT
	D7	341	UF341	#1 MAJOR FAULT
	D8	342	UF342	#2 MAJOR FAULT
	D9	343	UF343	#3 MAJOR FAULT
	D10	344	UF344	#4 MAJOR FAULT
	D11	349	UF349	MODULE MAJOR FAULT
	D12	353	UF353	EXTERNAL I/F PCB ABNORMAL
	D13	371	UF371	CTRL.CIRCUIT ERR.
	D14	372	UF372	CTRL.CIRCUIT ERR.
D15	374	UF374	CTRL.CIRCUIT ERR.	

Alarm 5	D0	375	UF375	CTRL.CIRCUIT ERR.
	D1	376	UF376	CTRL.CIRCUIT ERR.
	D2	377	UF377	CTRL.CIRCUIT ERR.
	D3	378	UF378	CTRL.CIRCUIT ERR.
	D4	381	UF381	CTRL.CIRCUIT ERR.
	D5	382	UF382	CTRL.CIRCUIT ERR.
	D6	383	UF383	CTRL.CIRCUIT ERR.
	D7	384	UF384	CTRL.CIRCUIT ERR.
	D8	385	UF385	CTRL.CIRCUIT ERR.
	D9	401	UF401	52S ABNORMAL
	D10	402	UF402	52S ABNORMAL
	D11	420	UF420	52L OPERATION ERR.
	D12	451	UF451	52S ABNORMAL
	D13	452	UF452	CB3 ABNORMAL
	D14			
D15				
Alarm 7	D0			
	D1			
	D2			
	D3			
	D4			
	D5			
	D6			
	D7			
	D8			
	D9			
	D10			
	D11			
	D12	868	UA868	CPMC OPEN
	D13			
	D14			
D15				

B.4 9900D Alarm Flag Table

Device	Bit	Failure Code	Display Code	Item
Alarm1	D0	805	UA805	OVERLOAD
	D1	806	UA806	INVERTER OVERLOAD
	D2	807	UA807	INVERTER OVERLOAD
	D3	808	UA808	OVERLOAD
	D4	810	UA810	OVERLOAD
	D5	812	UA812	BYPS.VOLT.OUT RNG
	D6	813	UA813	BYPS.PHASE ABNL
	D7	814	UA814	BYPS.FREQ.OUT RNG
	D8	815	UA815	TRANSFER PROHIBITION
	D9	817	UA817	EMERG.STOP ACTIV.
	D10	821	UA821	REM.BUTTON CLOSE
	D11	822	UA822	LOC.BUTTON ABNL.
	D12	824	UA824	CB2 OPEN
	D13	830	UA830	INTERLOCK SWITCH ON
	D14	831	UA831	EMERG.BYPS.SW.ON
D15	833	UA833	52L OPEN	
Alarm2	D0	834	UA834	BATTERY DEPLETED
	D1	835	UA835	TRANS.INHIBITED
	D2	861	UA861	MODULE ALARM
	D3	862	UA862	MODULE MINOR FAULT
	D4	863	UA863	MOD.IN.VOLT.
	D5	864	UA864	MODULE OVERLOAD
	D6	865	UA865	MOD.BAT.END
	D7	866	UA866	BATT.END WA
	D8	890	UA890	EXTERNAL ALARM
	D9	6	UF006	CONVERTER ABNORMAL
	D10	55	UF055	CONVERTER ABNORMAL
	D11	151	UF151	BAT.VOLTAGE ABNL.
	D12	152	UF152	BAT.VOLTAGE ABNL.
	D13	156	UF156	CHG.STOPPED
	D14	157	UF157	BATTERY OVERTEMP.
D15	158	UF158	BATTERY LIQUID LOW	

Device	Bit	Failure Code	Display Code	Item
Alarm3	D0	161	UF161	CHG.STOPPED
	D1	162	UF162	BATTERY ABNORMAL
	D2	163	UF163	BAT.VOLTAGE ABNL.
	D3	172	UF172	BATTERY ABNORMAL
	D4	202	UF202	INVERTER UV.
	D5	253	UF253	CTRL.CIRCUIT ERR.
	D6	254	UF254	CTRL.CIRCUIT ERR.
	D7	256	UF256	O/P VOLTAGE ABNL.
	D8	258	UF258	LOAD ABNORMAL
	D9	301	UF301	CTRL.CIRCUIT ERR.
	D10	302	UF302	CTRL.CIRCUIT ERR.
	D11	303	UF303	CTRL.CIRCUIT ERR.
	D12	305	UF305	CTRL.CIRCUIT ERR.
	D13	306	UF306	CTRL.CIRCUIT ERR.
	D14	320	UF320	CTRL.CIRCUIT ERR.
D15	321	UF321	CTRL.CIRCUIT ERR.	
Alarm4	D0	322	UF322	CTRL.CIRCUIT ERR.
	D1	323	UF323	CTRL.CIRCUIT ERR.
	D2	324	UF324	CTRL.CIRCUIT ERR.
	D3	325	UF325	CTRL.CIRCUIT ERR.
	D4	326	UF326	CTRL.CIRCUIT ERR.
	D5	327	UF327	CTRL.CIRCUIT ERR.
	D6	340	UF340	MODULE MINOR FAULT
	D7	341	UF341	#1 MAJOR FAULT
	D8	342	UF342	#2 MAJOR FAULT
	D9	343	UF343	#3 MAJOR FAULT
	D10	344	UF344	#4 MAJOR FAULT
	D11	349	UF349	MODULE MAJOR FAULT
	D12	353	UF353	EXTERNAL I/F PCB ABNORMAL
	D13	371	UF371	CTRL.CIRCUIT ERR.
	D14	372	UF372	CTRL.CIRCUIT ERR.
D15	374	UF374	CTRL.CIRCUIT ERR.	

Device	Bit	Failure Code	Display Code	Item
Alarm5	D0	375	UF375	CTRL.CIRCUIT ERR.
	D1	376	UF376	CTRL.CIRCUIT ERR.
	D2	377	UF377	CTRL.CIRCUIT ERR.
	D3	378	UF378	CTRL.CIRCUIT ERR.
	D4	381	UF381	CTRL.CIRCUIT ERR.
	D5	382	UF382	CTRL.CIRCUIT ERR.
	D6	383	UF383	CTRL.CIRCUIT ERR.
	D7	384	UF384	CTRL.CIRCUIT ERR.
	D8	385	UF385	CTRL.CIRCUIT ERR.
	D9	401	UF401	52S ABNORMAL
	D10	402	UF402	52S ABNORMAL
	D11	420	UF420	52L OPERATION ERR.
	D12	451	UF451	52S ABNORMAL
	D13	452	UF452	CB3 ABNORMAL
	D14			
D15				
Alarm6	D0			
	D1			
	D2			
	D3			
	D4			
	D5			
	D6			
	D7			
	D8			
	D9			
	D10			
	D11			
	D12			
	D13			
	D14			
D15				

Device	Bit	Failure Code	Display Code	Item
Alarm7	D0			
	D1			
	D2			
	D3			
	D4			
	D5			
	D6			
	D7			
	D8			
	D9			
	D10			
	D11			
	D12	868	UA868	CPMC OPEN
	D13	386	UF386	LCD FAULT
D14	363	UF363	UPS CONTROL CIRCUIT ERROR	
D15	891	UA891	CHARGER PROHIBITED	
Alarm8	D0	892	UA892	DISCHARGE PROHIBITED
	D1	893	UA893	BATTERY ABNORMAL
	D2	816	UA816	BYP.VOLT.OUT RNG.2
	D3	373	UF373	STS CONT.CIR.ERR.
	D4	453	UF453	STS TEMP. ABNOMAL
	D5	345	UF345	#5 MAJOR FAULT
	D6	346	UF346	#6 MAJOR FAULT
	D7			
	D8			
	D9			
	D10			
	D11			
	D12			
	D13			
	D14			
D15	818	UA818	MODULE STOP	

Device	Bit	Failure Code	Display Code	Item
Alarm9	D0	837	UA837	BATTERY DEPLETED2
	D1			
	D2			
	D3			
	D4			
	D5			
	D6			
	D7			
	D8			
	D9			
	D10			
	D11			
	D12			
	D13			
	D14			
	D15			

B.5 SUMMIT Alarm Flag Table

Device	Bit	Failure Code	Display Code	Item
Alarm1	D0			
	D1	2	UF001	INPUT CIRCUIT ABNORMAL
	D2	4	UF002	CONVERTER OVERCURRENT
	D3	6	UF003	CONVERTER ABNORMAL
	D4	8	UF006	CONVERTER ABNORMAL
	D5	10	UF011	CB1 ABNORMAL
	D6	12	UF052	CB1 ABNORMAL
	D7	14	UF055	CONVERTER ABNORMAL
	D8	16	UF056	CONVERTER OVERCURRENT
	D9	18	UF059	INPUT CIRCUIT ABNORMAL
	D10	20	UF102	DC OVERVOLTAGE
	D11	22	UF103	DC UNDERVOLTAGE
	D12	24	UF108	CHOPPER OVERCURRENT
	D13	26	UF109	DC UNBALANCED
	D14	28	UF110	ZERO PHASE OVERCURRENT
	D15	30	UF111	UPS CONTROL CIRCUIT ERROR
Alarm2	D0	32	UF112	DC CIRCUIT ABNORMAL
	D1	34	UF128	CONTROL POWER SUPPLY ABNORMAL
	D2	36	UF119	DC GROUND FAULT
	D3	38	UF159	DC GROUND FAULT
	D4			
	D5	42	UF151	DC VOLTAGE ABNORMAL
	D6	44	UF152	DC VOLTAGE ABNORMAL
	D7			
	D8	48	UF154	CB2 ABNORMAL
	D9	50	UF156	CHG.STOPPED(BATTERYOVERTEMP.)
	D10	52	UF157	BATTERY OVERTEMPERATURE
	D11	54	UF158	BATTERY LIQUID LOW
	D12	56	UF160	UPS CONTROL CIRCUIT ERROR
	D13	58	UF161	CHG.STOPPED(DC VOLT. ABNORMAL)
	D14	60	UF162	BATTERY ABNORMAL
	D15	62	UF163	BATTERY VOLTAGE ABNORMAL

Alarm3	D0	64	UF170	VDB SENSOR ABNORMAL
	D1	66	UF171	UPS CONTROL CIRCUIT ERROR
	D2	68	UF172	CHG.STOPPED
	D3	70	UF057	CONVERTER OVERCURRENT
	D4	72	UF201	INVERTER OVERVOLTAGE
	D5	74	UF202	INVERTER UNDERVOLTAGE
	D6	76	UF203	INVERTER OVERCURRENT
	D7	78	UF204	OUTPUT CIRCUIT ABNORMAL
	D8	80	UF206	UPS CONTROL CIRCUIT ERROR
	D9	82	UF207	ZERO PHASE OVERCURRENT
	D10	84	UF208	UPS CONTROL CIRCUIT ERROR
	D11	86	UF209	52C ABNORMAL
	D12	88	UF210	52C ABNORMAL
	D13	90	UF211	52C ABNORMAL
	D14	92	UF004	CONVERTER OVERCURRENT
D15	94	UF214	COOLING FAN ABNORMAL	
Alarm4	D0	96	UF213	OVERTEMPERATURE
	D1	98	UF230	ZERO PHASE OVERCURRENT
	D2	100	UF217	INVERTER OVERVOLTAGE
	D3	102	UF253	UPS CONTROL CIRCUIT ERROR
	D4	104	UF256	OUTPUT VOLTAGE ABNORMAL
	D5	106	UF257	52C ABNORMAL
	D6	108	UF258	LOAD ABNORMAL
	D7	110	UF259	ANOTHER UPS ABNORMAL
	D8	112	UF113	DC CIRCUIT ABNORMAL
	D9	114	UF301	UPS CONTROL CIRCUIT ERROR
	D10	116	UF302	UPS CONTROL CIRCUIT ERROR
	D11	118	UF303	UPS CONTROL CIRCUIT ERROR
	D12	120	UF323	UPS CONTROL CIRCUIT ERROR
	D13	122	UF305	UPS CONTROL CIRCUIT ERROR
	D14	124	UF306	UPS CONTROL CIRCUIT ERROR
D15	126	UF309	INVERTER VOLTAGE ABNORMAL	

Alarm5	D0	128	UF310	CONTROL POWER SUPPLY ABNORMAL
	D1	130	UF320	UPS CONTROL CIRCUIT ERROR
	D2	132	UF331	UPS CONTROL CIRCUIT ERROR
	D3	134	UF332	UPS CONTROL CIRCUIT ERROR
	D4	136	UF333	UPS CONTROL CIRCUIT ERROR
	D5	138	UF334	UPS CONTROL CIRCUIT ERROR
	D6	140	UF352	CONTROL POWER SUPPLY ABNORMAL
	D7	142	UF363	UPS CONTROL CIRCUIT ERROR
	D8	144	UF372	UPS CONTROL CIRCUIT ERROR
	D9	146	UF374	UPS CONTROL CIRCUIT ERROR
	D10	148	UF375	UPS CONTROL CIRCUIT ERROR
	D11	150	UF376	UPS CONTROL CIRCUIT ERROR
	D12	152	UF377	UPS CONTROL CIRCUIT ERROR
	D13	154	UF378	UPS CONTROL CIRCUIT ERROR
	D14	156	UF379	UPS CONTROL CIRCUIT ERROR
D15	158	UF371	UPS CONTROL CIRCUIT ERROR	
Alarm6	D0	160	UF401	52S ABNORMAL
	D1	162	UF402	52S ABNORMAL
	D2	164	UF420	52L OPERATION ERROR
	D3			
	D4	168	UF451	52S ABNORMAL
	D5	170	UF452	CB3 ABNORMAL
	D6			
	D7			
	D8			
	D9			
	D10	180	UA801	AC INPUT VOLTAGE OUT OF RANGE
	D11	182	UA802	AC INPUT FREQUENCY OUT OF RANGE
	D12	184	UA803	AC INPUT PHASE ROTATION ERROR
	D13	186	UA804	CONVERTER OPE. PROHIBITION
	D14	188	UA805	INVERTER OVERLOAD
D15	190	UA806	INVERTER OVERLOAD	

Alarm7	D0	192	UA807	INVERTER OVERLOAD
	D1	194	UA808	INVERTER OVERLOAD
	D2			
	D3	198	UA810	INVERTER OVERLOAD
	D4	200	UA870	BALANCER OVERLOAD
	D5	202	UA812	BYPASS VOLTAGE OUT OF RANGE
	D6	204	UA813	BYPASS PHASE ROTATION ERROR
	D7	206	UA814	BYPASS FREQUENCY OUT OF RANGE
	D8	208	UA815	TRANSFER PROHIBITION
	D9			
	D10	212	UA817	EMERGENCY STOP ACTIVATED
	D11	214	UA821	TRANSFER PROHIBITION
	D12	216	UA822	TRANSFER PROHIBITION
	D13	218	UA824	CB2 OPEN
	D14	220	UA827	52C OPE. PROHIBITION
D15	222	UA831	EMERGENCY BYPASS SWITCH ON	
Alarm8	D0			
	D1	226	UA833	52L OPEN
	D2	228	UA834	BATTERY DEPLETED/AC OUT STOPPED
	D3	230	UA835	TRANSFER PROHIBITION
	D4	232	UA860	REMOTE BUTTON ABNORMAL
	D5	234	UA861	LOCAL BUTTON ABNORMAL
	D6	236	UA890	EXTERNAL ALARM
	D7	238	UA841	CONVERTER OPE. INHIBITED
	D8	240	UA828	COOLING FAN ABNORMAL
	D9			
	D10			
	D11			
	D12			
	D13			
	D14			
D15				

B.6 1100 Modbus Register List

Register Address	Item	R/W	Description	Note
0000-000F	Manufacturer	R	string(32)	
0010-001F	Model	R	string(32)	
0020-002F	Ups Software Version	R	string(32)	
0030-003F	Agent Software Version	R	string(32)	CS141 board software version if possible
0050	Nominal Input Voltage	R	V	
0051	Nominal Input Frequency	R	0.1Hz	
0052	Nominal Output Voltage	R	V	
0053	Nominal Output Frequency	R	0.1Hz	
0054	Nominal Output Capacity	R	0.1kVA	
0055	Nominal Output Power	R	Fixed: "50" or "80"	
0056	UPS Communication	R	NOT USED	
0057	Battery Status	R	normal(0), lowbattery(1) ,depleted(2)	
0058	Battery Charge	R	Floating(0), Charging(1) Resting(2), Discharging(3)	
0059	Seconds On Battery	R	second	
005B	Estimated Charge Remaining	R	%	
005C	Battery Voltage	R	0.1V	
005D	Battery Current	R	0.1A	
005F	Input Line Bads	R		
0060	Input Num Lines	R		
0061	Input Frequency	R	0.1Hz	
0062	Input Voltage 1	R	0.1V	
0065	Input Voltage 2	R	0.1V	
0068	Input Voltage 3	R	0.1V	
006B	Output Source	R	inverter(0), battery(1) bypass(2), other(5)	
006C	Output Frequency	R	0.1Hz	
006D	Output Num Lines	R		
006E	Output Voltage 1	R	0.1V	
006F	Output Current 1	R	0.1A	
0070	Output Power 1	R	0.1kW	

0071	Output Percent Load 1	R	NOT USED	
0072	Output Voltage 2	R	0.1V	
0073	Output Current 2	R	0.1A	
0074	Synchronous Status	R	inverter off(0) synchronous(1) asynchronous(2)	
0075	Output Percent Load 2	R	NOT USED	
0076	Output Voltage 3	R	0.1V	
0077	Output Current 3	R	0.1A	
0079	Output Percent Load 3	R	NOT USED	
007E	Load Power Factor	R	NOT USED	
007F	Bypass Frequency	R	0.1Hz	
0080	Bypass Num Lines	R		
0081	Bypass Voltage 1	R	0.1V	
0084	Bypass Voltage 2	R	0.1V	
0087	Bypass Voltage 3	R	0.1V	
008E	Alarm Temperature	R	non active(0),active(1)	
008F	Alarm Input Bad	R	non active(0),active(1)	
0090	Alarm Output Bad	R	non active(0),active(1)	
0091	Alarm Overload	R	non active(0),active(1)	
0092	Alarm Bypass Bad	R	non active(0),active(1)	
0093	Alarm Output Off	R	non active(0),active(1)	
0095	Alarm Charger Failure	R	non active(0),active(1)	
0096	Alarm System Off	R	non active(0),active(1)	
0097	Alarm Fan Failure	R	non active(0),active(1)	
0099	Alarm General Fault	R	non active(0),active(1)	
009A	Alarm Awaiting Power	R	non active(0),active(1)	
009D	Current Alarm Number	R		
009E	Current Alarm Item 1	R	*Refer to Alarm Flag Table	
009F	Current Alarm Item 2	R	*Refer to Alarm Flag Table	
00A0	Current Alarm Item 3	R	*Refer to Alarm Flag Table	
00A1	Current Alarm Item 4	R	*Refer to Alarm Flag Table	
00A2	Current Alarm Item 5	R	*Refer to Alarm Flag Table	
00A3	Current Alarm Item 6	R	*Refer to Alarm Flag Table	
00A4	Current Alarm Item 7	R	*Refer to Alarm Flag Table	
00A5	Current Alarm Item 8	R	*Refer to Alarm Flag Table	
00A6	Current Alarm Item 9	R	*Refer to Alarm Flag Table	
00A7	Current Alarm Item 10	R	*Refer to Alarm Flag Table	
00A8	Failure Flag 1	R	NOT USED	
00A9	Status Flag 1	R	NOT USED	
00AA	Status Flag 2	R	NOT USED	
00AB	Alarm Flag 1	R	*Refer to Alarm Flag Table	

00AC	Alarm Flag 2	R	*Refer to Alarm Flag Table	
00AD	Alarm Flag 3	R	*Refer to Alarm Flag Table	
00AE	Alarm Flag 4	R	*Refer to Alarm Flag Table	
00AF	Alarm Flag 5	R	*Refer to Alarm Flag Table	
00B0	Alarm Flag 6	R	*Refer to Alarm Flag Table	
00B1	Alarm Flag 7	R	*Refer to Alarm Flag Table	
00B2	Alarm Flag 8	R	*Refer to Alarm Flag Table	
00B3	Alarm Flag 9	R	*Refer to Alarm Flag Table	
00B4	Alarm Flag 10	R	*Refer to Alarm Flag Table	
00B5	Alarm Flag 11	R	*Refer to Alarm Flag Table	
00B6	Alarm Flag 12	R	*Refer to Alarm Flag Table	

B.7 1100 Alarm Flag Table

Device	Bit	Failure Code	Display Code	Item
Alarm1	D0			
	D1	2	UF303	UPS CONTROL CIRCUIT ERROR
	D2	4	UF305	UPS CONTROL CIRCUIT ERROR
	D3	6	UF202	OUTPUT UNDERVOLTAGE
	D4	8	UF258	LOAD ABNORMAL
	D5	10	UF301	UPS CONTROL CIRCUIT ERROR
	D6	12	UF302	UPS CONTROL CIRCUIT ERROR
	D7	14	UF306	UPS POWER SUPPLY ABNORMAL
	D8	16	UF320	UPS CONTROL CIRCUIT ERROR
	D9	18	UF349	MODULE MAJOR FAULT
	D10	20	UF340	MODULE MINOR FAULT
	D11	22	UF341	MODULE 1 MAJOR FAULT
	D12	24	UF342	MODULE 2 MAJOR FAULT
	D13	26	UF343	MODULE 3 MAJOR FAULT
	D14	28	UF344	MODULE 4 MAJOR FAULT
D15	30	UF345	MODULE 5 MAJOR FAULT	
Alarm2	D0	32	UF401	52S ABNORMAL
	D1	34	UF402	52S ABNORMAL
	D2	36	UF055	CONVERTER ABNORMAL
	D3	38	UF151	BATTERY VOLTAGE ABNORMAL
	D4	40	UF156	CHG.STOPPED (BATTERY OVERTEMP)
	D5	42	UF157	BATTERY OVERTEMPERATURE
	D6	44	UF158	BATTERY LIQUID LOW
	D7	46	UF161	CHG.STOPPED (DC VOLT. ABNORMAL)
	D8	48	UF162	BATTERY ABNORMAL
	D9	50	UF163	BATTERY VOLTAGE ABNORMAL
	D10	52	UF253	UPS CONTROL CIRCUIT ERROR
	D11	54	UF256	OUTPUT VOLTAGE ABNORMAL
	D12	56	UF351	CONTROL POWER SUPPLY ABNORMAL
	D13	58	UF352	CONTROL POWER SUPPLY ABNORMAL
	D14	60	UF372	UPS CONTROL CIRCUIT ERROR
D15	62	UF376	UPS CONTROL CIRCUIT ERROR	

Alarm3	D0	64	UF377	UPS CONTROL CIRCUIT ERROR
	D1			
	D2	68	UF452	CB3 ABNORMAL
	D3	70	UA805	OVERLOAD
	D4	72	UA806	INVERTER OVERLOAD
	D5	74	UA807	INVERTER OVERLOAD
	D6	76	UA808	OVERLOAD
	D7			
	D8	80	UA812	BYPASS VOLTAGE OUT OF RANGE
	D9	82	UA813	BYPASS PHASE ROTATION ERROR
	D10	84	UA814	BYPASS FREQUENCY OUT OF RANGE
	D11	86	UA817	EMERGENCY STOP
	D12	88	UA819	REMOTE BUTTON ABNORMAL
	D13	90	UA820	LOCAL BUTTON ABNORMAL
	D14			
D15				
Alarm4	D0	96	UA830	INTERLOCK SWITCH ON
	D1	98	UA831	EMERGENCY BYPASS SWITCH ON
	D2	100	UA834	BATTERY DEPLETED AC OUT STOPPED
	D3	102	UA835	TRANSFER INHIBIT
	D4	104	UA861	MODULE ALARM
	D5	106	UA862	MODULE MINOR FAULT
	D6	108	UA863	MODULE INPUT VOLT. OUT OF RANGE
	D7	110	UA864	MODULE OVERLOAD
	D8	112	UA865	MODULE BATTERY DEPLETED
	D9	114	UA890	EXTERNAL ALARM
	D10	116	UF323	UPS CONTROL CIRCUIT ERROR
	D11	118	UF353	EXTERNAL I/F PCB ABNORMAL
	D12	120	UF254	UPS CONTROL CIRCUIT ERROR
	D13	122	UA866	BATTERY DEPLETED ALARM
	D14	124	UA824	72B OPEN
D15	126	UF346	MODULE 6 MAJOR FAULT	

Alarm5	D0	128	UF347	MODULE 7 MAJOR FAULT
	D1	130	UF348	MODULE 8 MAJOR FAULT
	D2			
	D3			
	D4			
	D5			
	D6			
	D7			
	D8			
	D9			
	D10			
	D11			
	D12			
	D13			
	D14			
	D15			

B.8 7011B Modbus Register List

Register Address	Item	R/W	Description	Note
0000-000F	Manufacturer	R	string(32)	
0010-001F	Model	R	string(32)	
0020-002F	Ups Software Version	R	string(32)	
0030-003F	Agent Software Version	R	string(32)	CS141 board software version if possible
0050	Nominal Input Voltage	R	V	
0051	Nominal Input Frequency	R	0.1Hz	
0052	Nominal Output Voltage	R	V	
0053	Nominal Output Frequency	R	0.1Hz	
0054	Nominal Output Capacity	R	0.1kVA	
0055	Nominal Output Power	R	0.1kW	
0056	UPS Communication	R	NOT USED	
0057	Battery Status	R	normal(0), lowbattery(1) ,depleted(2)	
0058	Battery Charge	R	Floating(0), Charging(1) Resting(2), Discharging(3)	
0059	Seconds On Battery	R	second	
005B	Estimated Charge Remaining	R	%	
005C	Battery Voltage	R	0.1V	
005D	Battery Current	R	0.1A	
005F	Input Line Bads	R	NOT USED	
0060	Input Num Lines	R		
0061	Input Frequency	R	0.1Hz	
0062	Input Voltage 1	R	0.1V	
0065	Input Voltage 2	R	0.1V	
0068	Input Voltage 3	R	0.1V	
006B	Output Source	R	inverter(0), battery(1) bypass(2), other(5)	
006C	Output Frequency	R	0.1Hz	

006D	Output Num Lines	R		
006E	Output Voltage 1	R	0.1V	
006F	Output Current 1	R	0.1A	
0070	Output Power 1	R	0.1kW	
0071	Output Percent Load 1	R	%	
0072	Output Voltage 2	R	0.1V	
0073	Output Current 2	R	0.1A	
0074	Synchronous Status	R	NOT USED	
0075	Output Percent Load 2	R	%	
0076	Output Voltage 3	R	0.1V	
0077	Output Current 3	R	0.1A	
0079	Output Percent Load 3	R	%	
007E	Load Power Factor	R	NOT USED	
007F	Bypass Frequency	R	0.1Hz	
0080	Bypass Num Lines	R	NOT USED	
0081	Bypass Voltage 1	R	0.1V	
0084	Bypass Voltage 2	R	0.1V	
0087	Bypass Voltage 3	R	0.1V	
008E	Alarm Temperature	R	non active(0),active(1)	
008F	Alarm Input Bad	R	non active(0),active(1)	
0090	Alarm Output Bad	R	non active(0),active(1)	
0091	Alarm Overload	R	non active(0),active(1)	
0092	Alarm Bypass Bad	R	non active(0),active(1)	
0093	Alarm Output Off	R	non active(0),active(1)	
0095	Alarm Charger Failure	R	non active(0),active(1)	
0096	Alarm System Off	R	non active(0),active(1)	
0097	Alarm Fan Failure	R	non active(0),active(1)	
0099	Alarm General Fault	R	non active(0),active(1)	
009A	Alarm Awaiting Power	R	non active(0),active(1)	
009D	Current Alarm Number	R		
009E	Current Alarm Item 1	R	*Refer to Alarm Flag Table	
009F	Current Alarm Item 2	R	*Refer to Alarm Flag Table	
00A0	Current Alarm Item 3	R	*Refer to Alarm Flag Table	
00A1	Current Alarm Item 4	R	*Refer to Alarm Flag Table	
00A2	Current Alarm Item 5	R	*Refer to Alarm Flag Table	
00A3	Current Alarm Item 6	R	*Refer to Alarm Flag Table	

00A4	Current Alarm Item 7	R	*Refer to Alarm Flag Table	
00A5	Current Alarm Item 8	R	*Refer to Alarm Flag Table	
00A6	Current Alarm Item 9	R	*Refer to Alarm Flag Table	
00A7	Current Alarm Item 10	R	*Refer to Alarm Flag Table	
00A8	Failure Flag 1	R	NOT USED	
00A9	Status Flag 1	R	NOT USED	
00AA	Status Flag 2	R	NOT USED	
00AB	Alarm Flag 1	R	*Refer to Alarm Flag Table	
00AC	Alarm Flag 2	R	*Refer to Alarm Flag Table	
00AD	Alarm Flag 3	R	*Refer to Alarm Flag Table	
00AE	Alarm Flag 4	R	*Refer to Alarm Flag Table	
00AF	Alarm Flag 5	R	*Refer to Alarm Flag Table	
00B0	Alarm Flag 6	R	*Refer to Alarm Flag Table	
00B1	Alarm Flag 7	R	*Refer to Alarm Flag Table	
00B2	Alarm Flag 8	R	*Refer to Alarm Flag Table	
00B3	Alarm Flag 9	R	*Refer to Alarm Flag Table	
00B4	Alarm Flag 10	R	*Refer to Alarm Flag Table	
00B5	Alarm Flag 11	R	*Refer to Alarm Flag Table	
00B6	Alarm Flag 12	R	*Refer to Alarm Flag Table	

B.9 7011B Alarm Flag Table

Device	Bit	Failure Code	Display Code	Item
Alarm1	D0			
	D1	2	UF003	PRECHARGE FAULT
	D2	4	UF102	DC OVERVOLTAGE
	D3	6	UF103	DC UNDERVOLTAGE
	D4	8	UF109	DC UNBALANCED
	D5	10	UF112	DC CIRCUIT ABNORMAL
	D6	12	UF201	AC OUTPUT OVERVOLTAGE
	D7	14	UF202	AC OUTPUT UNDERVOLTAGE
	D8	16	UF218	UPS CONTROL CIRCUIT ERROR
	D9	18	UF230	UPS CONTROL CIRCUIT ERROR
	D10	20	UF301	UPS CONTROL CIRCUIT ERROR
	D11	22	UF302	UPS CONTROL CIRCUIT ERROR
	D12	24	UF303	UPS CONTROL CIRCUIT ERROR
	D13	26	UF305	UPS CONTROL CIRCUIT ERROR
	D14	28	UF306	CONTROL POWER SUPPLY ABNORMAL
	D15	30	UF323	UPS CONTROL CIRCUIT ERROR
Alarm2	D0	32	UF349	ALL MODULE FAULT
	D1	34	UF401	52S ABNORMAL
	D2	36	UF402	52S ABNORMAL
	D3	38	UF552	DUMMY FAULT
	D4	40	UF061	MOD. 1 CONV. ABNORMAL
	D5	42	UF062	MOD. 2 CONV. ABNORMAL
	D6	44	UF063	MOD. 3 CONV. ABNORMAL
	D7	46	UF064	MOD. 4 CONV. ABNORMAL
	D8	48	UF104	DISCHARGE FAULT
	D9	50	UF151	DC VOLTAGE ABNORMAL
	D10			
	D11	54	UF156	CHG.STOPPED (BATTERY OVERTEMP)
	D12	56	UF157	BATTERY OVERTEMPERATURE
	D13	58	UF161	CHG.STOPPED (DC VOLT. ABNORMAL)
	D14	60	UF162	BATTERY ABNORMAL
	D15	62	UF163	BATTERY VOLTAGE ABNORMAL

Alarm3	D0	64		BATTERY WARNING
	D1	66		BATTERY UPDATE
	D2	68		BATTERY CUTOFF
	D3	70	UF181	MOD. 1 CHOP. ABNORMAL
	D4	72	UF182	MOD. 2 CHOP. ABNORMAL
	D5			
	D6			
	D7	78	UF191	MOD. 1 DC OVERVOLTAGE
	D8	80	UF192	MOD. 2 DC OVERVOLTAGE
	D9			
	D10			
	D11	86	UF254	UPS CONTROL CIRCUIT ERROR
	D12	88	UF256	AC OUTPUT VOLTAGE ABNORMAL
	D13	90	UF258	LOAD ABNORMAL
	D14	92	UF261	MOD. 1 INVERTER ABNORMAL
D15	94	UF262	MOD. 2 INVERTER ABNORMAL	
Alarm4	D0			
	D1			
	D2	100	UF271	MOD. 1 INVERTER OVERCURRENT
	D3	102	UF272	MOD. 2 INVERTER OVERCURRENT
	D4			
	D5			
	D6	108	UF281	MOD. 1 OVERTEMPERATURE
	D7	110	UF282	MOD. 2 OVERTEMPERATURE
	D8			
	D9			
	D10	116		UPS UPDATE
	D11	118	UF352	CONTROL POWER SUPPLY ABNORMAL
	D12	120	UF371	UPS CONTROL CIRCUIT ERROR
	D13	122	UF372	UPS CONTROL CIRCUIT ERROR
	D14	124	UF451	52S ABNORMAL
D15	126	UF455	BYPASS CIRCUIT ABNORMAL	

Alarm5	D0	128	UA801	AC INPUT VOLTAGE OUT OF RANGE 2
	D1	130	UA802	AC INPUT FREQUENCY OUT OF RANGE 2
	D2	132	UA803	AC INPUT PHASE ROTATION ERROR
	D3	134	UA806	OVERLOAD
	D4	136	UA807	POWER OVERLOAD
	D5	138	UA808	OVERLOAD ALARM
	D6	140	UA809	POWER OVERLOAD ALARM
	D7	142	UA810	INSTANT OVERLOAD
	D8	144	UA812	AC INPUT VOLTAGE OUT OF RANGE 1
	D9	146	UA814	AC INPUT FREQUENCY OUT OF RANGE 1
	D10	148	UA817	EMERGENCY STOP ACTIVATED
	D11	150	UA831	EMERGENCY BYPASS SWITCH ON
	D12	152	UA834	BATTERY DEPLETED
	D13	154	UA835	BATTERY DEPLETED ALARM
	D14	156	UA840	SHUTDOWN 1
D15	158	UA841	SHUTDOWN 2	
Alarm6	D0	160	UA860	REMOTE BUTTON ABNORMAL
	D1	162	UA861	LOCAL BUTTON ABNORMAL
	D2	164	UA845	UPS CONTROL CIRCUIT ERROR
	D3			
	D4	168	UA816	LOAD ON BYPASS LONG TIME
	D5	170	UF071	MOD. 1 CONV. ABNORMAL
	D6	172	UF072	MOD. 3 CONV. ABNORMAL
	D7			
	D8			
	D9	178	UF307	CONTROL POWER SUPPLY ABNORMAL
	D10			
	D11			
	D12			
	D13			
	D14			
D15				

C. BACnet Objects

Object Type	Object ID	Object Name
Analog Input	0	Output Voltage Phase 1
Analog Input	1	Output Voltage Phase 2
Analog Input	2	Output Voltage Phase 3
Analog Input	3	Output Power Percent 1
Analog Input	4	Output Power Percent 2
Analog Input	5	Output Power Percent 3
Analog Input	6	Battery Capacity
Analog Input	7	Input Voltage Phase 1
Analog Input	8	Input Voltage Phase 2
Analog Input	9	Input Voltage Phase 3
Analog Input	12	UPS Status (see table below)
Analog Input	13	Battery Voltage
Analog Input	14	Input Frequency
Binary Input	0	Alarm: Battery Bad
Binary Input	1	Alarm: On Battery
Binary Input	2	Alarm: Battery Low
Binary Input	3	Alarm: Battery Depleted
Binary Input	4	Alarm: Over Temperature
Binary Input	5	Alarm: Input Bad
Binary Input	6	Alarm: Output Bad
Binary Input	7	Alarm: Output Overload
Binary Input	8	Alarm: On Bypass
Binary Input	9	Alarm: Bypass Bad
Binary Input	10	Alarm: Output Off by Request
Binary Input	11	Alarm: UPS Off by Request
Binary Input	12	Alarm: Charger Failed
Binary Input	13	Alarm: UPS Output Off
Binary Input	14	Alarm: UPS System Off
Binary Input	15	Alarm: Fan Failure
Binary Input	16	Alarm: Fuse Failure
Binary Input	17	Alarm: General Fault
Binary Input	18	Alarm: Diagnose Test Failed
Binary Input	19	Alarm: Communication Lost
Binary Input	20	Alarm: Awaiting Power
Binary Input	21	Alarm: Shutdown Pending
Binary Input	22	Alarm: Shutdown Imminent
Binary Input	23	Alarm: Test in Progress

UPS Status Register			
UPS Status	Hex Value	Dec Value	Description
UPS Bypass Mode	0x0001	1	UPS on Bypass
UPS Shutdown	0x0002	2	UPS shutdown
UPS On Inverter	0x0004	4	UPS on Inverter
UPS On Battery	0x0008	8	UPS on Battery
UPS Low Battery Error	0x0010	16	UPS low battery failure
UPS Over Temp Error	0x0020	32	UPS over temp failure
UPS Test in Progress	0x0040	64	UPS test in progress
UPS Over Power Error	0x0080	128	UPS over power failure
UPS Overload Error	0x0100	256	UPS overload
UPS Inverter Error	0x0200	512	UPS Inverter failure
UPS Battery Error	0x0400	1024	UPS Battery failure
UPS Eco Mode	0x0800	2048	UPS eco mode
UPS Inverter Warn	0x1000	4096	UPS Inverter warning
UPS Failed	0x2000	8192	UPS failed
UPS Comm Lost	0x4000	16384	UPS comm lost

