



Spectro *Modular* User Manual

EIS-Powered Rapid Battery Tester
Model 11-500-0201-00

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Warranty and Service

Cadex Electronics Inc. warrants the Spectro *Modular* and its internal battery against defective materials and workmanship for two years from the original purchase date. Cables, clamps, and accessories are warranted against defective materials and workmanship for ninety days from the original purchase date.

The warranty does not cover:

- Damage caused by abuse, negligence, accident, or improper installation.
- Damage caused by improper use of Spectro *Modular* and its accessories.
- Damage caused by an attempted repair not authorized by Cadex Electronics Inc.

- Changes or modifications to the equipment not expressively approved in writing by Cadex in writing
- Cosmetic damage caused by normal wear and tear.
- Damage from external causes such as leakage spills, power fluctuations or failure.
- Equipment received without the appropriate model number, serial number, or safety markings.
- Damage caused in transit due to improper packaging.
- Equipment used for rental purposes

Before sending a unit for service, contact Cadex Technical Support at:

service@cadex.com (Canada) 1-604-231-7777 (USA Toll Free) 800-565-5228
(Europe) +49 (0) 911 240 332-0

Warranty Service

- If the equipment qualifies for warranty service, a Cadex representative will provide a Return Materials Authorization form (RMA) or number and the location of the nearest service center.
- Ship the equipment to the service center with freight, insurance, customs and duties prepaid. The RMA form must be included to obtain warranty service.
- Ensure that the equipment is properly packaged before shipping, preferably in the original Cadex boxes.
- Equipment returned from warranty service will be shipped with freight prepaid by Cadex.

Non-Warranty Service

If the equipment is not covered by warranty, a Cadex representative will provide the contact information for the nearest service center. Contact the service center directly to arrange to send the product in for service. An RMA form or number will be provided only if the product is returning to the Cadex Head Office.

- Ship the equipment to the service center with freight, insurance, customs and duties prepaid.
- Ensure that the equipment is properly packaged before shipping.

Note: Cadex and Cadex authorized service centers require a Purchase Order or written authorization to proceed with Non-warranty service repairs.

Disposal

Dispose of the equipment according to local jurisdiction requirements. For assistance in determining proper disposal practices, contact Cadex Technical Support: service@cadex.com.

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Safety Information

Use of Spectro *Modular*

Cadex Spectro *Modular* EIS-Powered Rapid Battery Tester is designed with adequate safeguards to protect user from shock and other hazards when used as specified within this manual. However, if the equipment is used in a manner not specified in this manual, the protection provided may be impaired. Please read this manual and product labeling before use.

Modification of Equipment

CE, UKCA, ETL, FCC and other approvals apply to Cadex Spectro *Modular* EIS-Powered Rapid Battery Tester in its factory-authorized configuration. Changes or modification to the equipment not expressly approved by Cadex will void regulatory safety approvals and void user's authority to operate the equipment.

Disposal of Waste WEEE



This symbol on the product and package indicates that this product must not be disposed of with unsorted municipal waste. Instead, it is the user's responsibility to dispose of WEEE by handing it over to a designated collection point for the disposal. The separate collection and recycling of waste equipment will help conserve natural resources and ensure that it is disposed of in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for disposal, please contact your local municipal office, waste disposal service or wherever you purchased the product.

RoHS Compliance

The Spectro *Modular* EIS-Powered Rapid Battery Tester complies with the European Union's Directive 2002/95/EC, Restrictions of Hazardous Substances (RoHS).

Explosion Hazard



Batteries can burst if treated improperly. Follow these precautions at all times.

- Do not short the positive and negative battery terminals together.
- Do not exceed the battery manufacturer's recommended charge current and voltage limits for batteries

Warning & Caution Labels



Warning and caution indications in this Spectro *Modular* User Manual are marked with the symbol at the left.

- Warnings indicate required actions to prevent serious injury to a user
- Cautions indicate required actions to prevent serious damage to the equipment.

Electrical Safety



Warnings:

- The safety, reliability, and performance of Spectro *Modular* can be assured only if the electrical installation of the facility where it is configured meets the appropriate regulatory requirements.
- To avoid the risk of electric shock, Spectro *Modular* must only be connected with the provided power supply.

Electromagnetic Safety



Cautions:

- Spectro *Modular* complies with EN 61326-1 for EMC when properly configured with supplied components, including the power supply. Failure to use the supplied components may lead to increased electromagnetic emissions or decreased electromagnetic immunity.
- Portable radio frequency (RF) communications equipment can cause Spectro *Modular* performance degradation and, as such, should be used with other system with appropriate distance.



Warnings:

- Due to Radio Frequency exposure limit, the distance from the Spectro *Modular* to a user (human body) needs to be at least 20 cm (7.87 inches) during operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Equipment Safety



Warnings:

- Read all instructions in this manual before using Spectro *Modular*.
- Refer to the vehicle owners' manual or the battery manufacturer MSDS (Material Safety Data Sheet) for specific handling and safety information.
- Gases produced by a battery are explosive. Test batteries in a well ventilated area and use extreme caution when working with batteries.
- When testing an in-vehicle battery, always wear proper eye protection and never lean over battery.
- Do not use Spectro *Modular* in CAT II, CAT III or CAT IV measurement circuits.
- Keep cords and cables clear from moving engine parts.



Cautions:

- Always inspect a battery for physical damage before testing.
- Ensure that the vent caps are tight and level.
- Avoid spilling liquid onto the connectors during cleaning and working with automotive fluids as this could damage the unit.

Operational Safety



Warnings:

- Spectro *Modular* must be used as specified in the user manual.
- Do not attempt to service or maintain any parts of Spectro *Modular*.
- Do not touch the battery or clamp during battery scan.



Cautions:

- Do not operate the Spectro *Modular* if any of the parts are damaged or worn.
- Only use the power supply and clamp cables provided from Cadex Electronics Inc.

2 About Spectro Modular

Spectro Modular EIS-Powered Rapid Battery Tester is designed for lead acid batteries, and the model SPB16 assesses the state of health of 12V batteries.

Spectro Modular operates while connected to a host or mobile device. Throughout this manual, the term “host” refers to a PC host or mobile device such as a Tablet, or Phone.

User Responsibility

The Spectro *Modular* EIS-Powered Rapid Battery Tester is designed with adequate safeguards to protect the user from shock and other hazards when used as specified within this manual. Please read this document and the equipment labeling before use.

The user is responsible for operating Spectro *Modular* in accordance with the instructions in this user manual.

System Requirements

Cadex Link supported web browsers: Google Chrome revision 91, Microsoft Edge revision 92
Typical resolutions for Cadex Link: 1080x2340, 1400x3200, 1920x1200, 2560x1600
BLE 4.2 or greater






Glossary of Terms and Symbols

Terminology, abbreviations and symbols are listed in the following tables. These may appear in:

- User Manual
- Quick Reference Guide
- Labels and associated documentation
- Software User Interfaces
- Other accessory components

AGM	Absorbed-glass-mat battery type
Ah (Ampere hour)	European units for reserve capacity
Battery Type	The structure for the battery (e.g. AGM, FLD, Li-Ion)
CA	Cranking Amps: The current a battery can deliver for 30 seconds at 0°C (32°F) without dropping below 7.2V
CCA	Cold Cranking Amps: The current a battery can deliver for 30 seconds at -18°C

	(0°F) without dropping below 7.2V
DIN	German Standard (Deutsches Institut für Normung)
EN	European Norm standard
EIS	Electrochemical Impedance Spectroscopy
EMC	Electromagnetic Compatibility
FLD	Flooded battery type
IEC	International Electrical Commission
MCA	Marine Cranking Amps
OCV	Open Circuit Voltage
PDI	Pre-Delivery Inspection
RC	Reserve Capacity
SAE	Society of Automotive Engineers
SoC	State of Charge
SoH	State of Health
UI	User Interface
VIN	Vehicle Identification Number
VRLA	Valve-Regulated Lead-Acid
USB	Universal Serial Bus

Symbol	Title	Description
	Unique equipment data matrix	A form of serialization used for regulatory, supply chain traceability and anti-counterfeiting.
	Date of Manufacture	Indicates the date when the equipment was manufactured.
	Manufacturer	Indicates the equipment manufacturer.
	Refer to Manual	Indicates to read the instructions in the user manual before operating the equipment.
	Caution!	Indicates that caution is necessary when operating the equipment or control near where the symbol is placed, or that the current situation needs operator awareness or operator action in order to avoid undesirable consequences.

3 Introduction

Equipment Description

The Spectro *Modular* EIS-powered rapid battery tester is designed to assess various 12V lead acid batteries

Overview

Intended Use

Spectro *Modular* uses the Electrochemical Impedance Spectroscopy (EIS) method to measure battery performance in various indoor environments such as professional workshops, vehicle manufacturing, port authorities, public safety facilities, commercial installations and military.

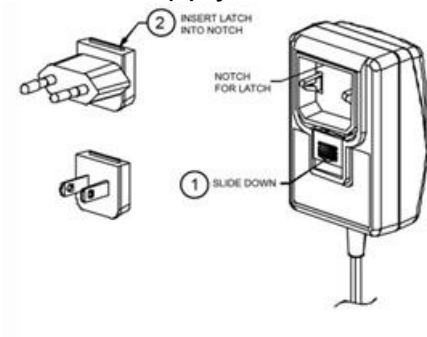
Features



Spectro *Modular* includes the following items in the Box:

ID#	Components	Quantity
1	EIS-Powered Rapid Battery Tester	1
2	Clamp Cable	1
3	5.0V Output Power Supply (with 2 Inter-changeable blade sets)	1
4	Quick Reference Guide	1
5	Unit Case	1

Power Supply









EIS-Powered Rapid Battery Tester

ID#	Description
1	USB-C Internal Battery Charging Port
2	Hard reset button
3	DB15 Clamp Cable Port



Front Label & LEDs



#	Icon	Color Indicator	Description
1		No light Solid Blue	Bluetooth Button and LED Bluetooth not paired with a host Bluetooth paired
2		No light Solid Green Blinking Green	Wi-Fi not connected to Cloud Wi-Fi connected Connecting to Wi-Fi
3		No light Solid Green Blinking Green	Spectro <i>Modular</i> is off Spectro is on with more than 15% internal SOC Internal battery is low (SOC below 15%)
4		No light, Solid Amber	When connected to power supply: Internal battery is fully charged Internal battery is charging
5		No light Solid Green Blinking Red Solid Red	Test is not running Battery test is in progress Internal battery is too low to run a test (SOC below 5%) Fault on battery-under-test, or test failed to complete. Check Cadex Link for notifications.
6		N/A	Button to turn power on or off.

4 Setup & Operation

The Spectro *Modular* operation is based on measuring the state of health of a battery. To do so it is connected to a host or mobile device via Bluetooth. Using the host's web browser, the user launches a web-based application Cadex Link. EIS processing relies on user input of the battery parameters for testing CCA and Reserve Capacity. The Spectro *Modular* then assesses complete SoH of a battery and provides a comprehensive report.

Setup Spectro *Modular*

Hardware

- Before initial use of Spectro Modular, ensure the internal batteries are fully charged by connecting the provided power supply. When the Charging LED stops indicating yellow, the battery is fully charged.
- Plug the clamp cable into the DB-15 clamp cable port and tighten the thumb-screws.

Power on and off

▼ To power on the EIS-Powered Rapid Battery Tester:

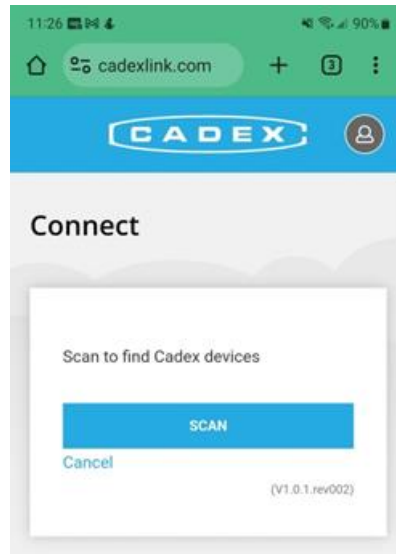
On the Spectro *Modular* front face Press the  power button.

To power off, press and hold the power button for approximately 3 seconds.

Software & Host

Choose a device to use with the Spectro *Modular* unit and prepare it by running the Cadex Link web App.

- Ensure the host has access to the internet
- Open a supported browser in the host (See System Requirements)
- Enter the Cadex Link URL: www.cadexlink.com
- Note the scan Cadex devices page appears.



Spectro *Modular* is now ready to start testing batteries. See the workflow section below for the process.

Note: If records are to be transferred to cloud storage, also set up an account in Cadex Cloud. See the section Advanced Settings for details.

Workflow

Scan of a battery is divided into steps:

- At start of a testing session, connect the Spectro *Modular* unit and the host
- For each battery
 - Preparation for the test
 - Execute the Test
 - Report results

Connecting Spectro *Modular*

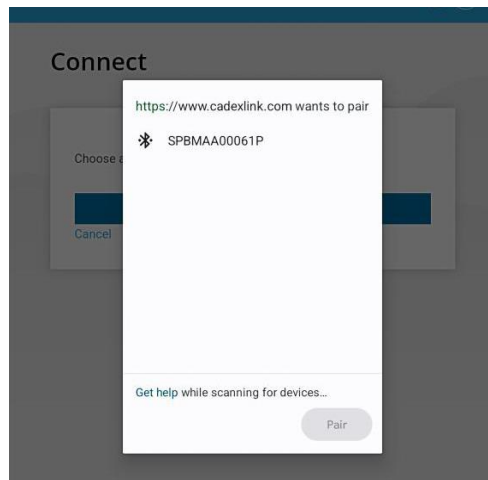
Bluetooth Pairing

▼To pair the EIS-Powered Rapid Battery Tester to your host (e.g. Samsung Tablet):

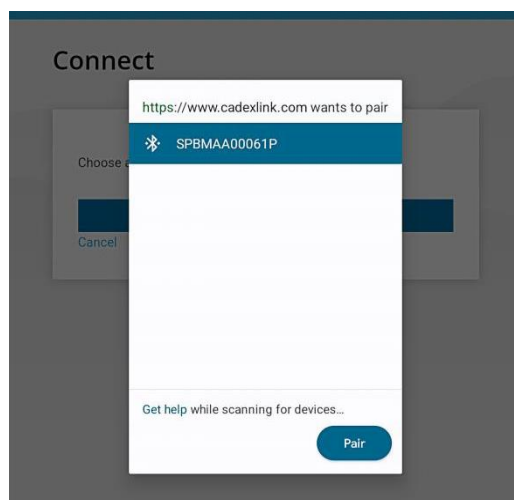
1. Power on the Spectro unit.
2. After launching Cadex Link on the host, select **Scan**.
3. A dialog pop-up appears listing all Spectro *Modular* equipment within Bluetooth range.

Notes: If necessary, navigate to the mobile device's settings page and use the "Add Bluetooth Device" function.

For a successful battery test, it is important to locate the host within 9m/27.7ft of the Spectro *Modular* to ensure Bluetooth stays connected.



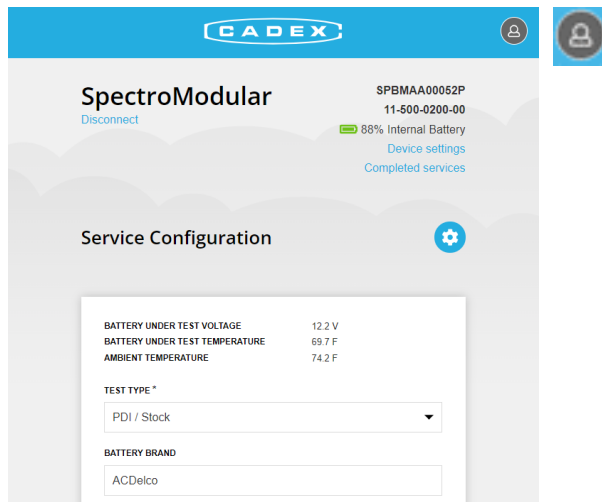
4. Select your equipment.
 - Tap on the serial number for your unit in the list, (The serial number can be found on the label on the bottom side of the Spectro *Modular* unit)




5. Select **Pair**.

Once the host and Spectro *Modular* unit are paired, the Bluetooth LED appears lit in blue.

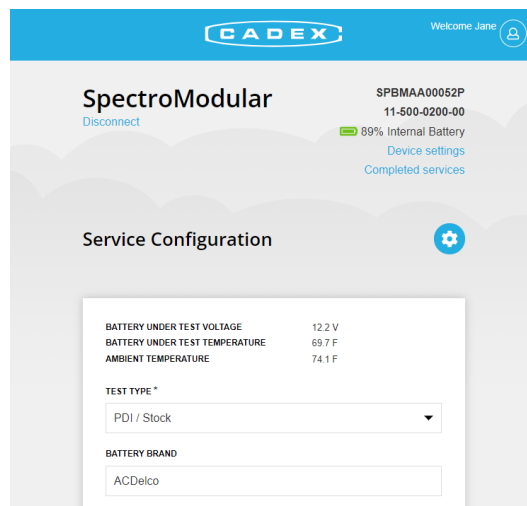
6. The service configuration page appears.



Note: The user icon on the top right side of the screen  indicates user's sign in status.

A grey background on the user icon indicates that user has not signed on to Cadex Cloud.

A blue background indicates user has signed in to Cadex Cloud.



Notes:

- Users may initiate battery service without signing into their Cadex Cloud account, however functionality will be limited. For complete functionality, register and sign into Cadex Cloud.
- If you do not already have a Cadex Cloud account, read the section: "Create a Cadex Cloud Account" for steps to create one.

Preparation for the Test

- 1 Turn off vehicle loads
- 2 Clean battery
- 3 Clamp to battery
- 4 Note battery specification

Important Notice:

To prevent the Spectro *Modular's* internal battery from discharging too deeply, always charge it after use and at a minimum charge it overnight.

Use only the power-supply and power cord supplied with the equipment.

Turn off vehicle loads

If testing the battery in-vehicle, turn off any vehicle loads such as: heaters, headlights, audio/video equipment and confirm that doors are closed. Ensure that the vehicle ignition is in the OFF position.

Clean Battery Terminals

Clean the battery terminals with a wire brush if they are dirty. Dirty or worn contacts may result in inaccurate readings.

Clamp Cable

For best results, connect the clamps directly to the battery terminals. Ensure that both jaws of each clamp are firmly biting the terminal. Connect the black clamp to the negative terminal, and the red clamp to the positive terminal.

Note: Avoid attaching the tester clamps to the battery bus bar or battery terminal bolts. This may give incorrect results.

Note the Battery Specification

Check the label on the battery-under-test, or the battery specification sheet to find battery test input values: CCA (SAE) and RC/Ah. These will be needed in the next step. Incorrect entries will impact the measurement.

Battery Service

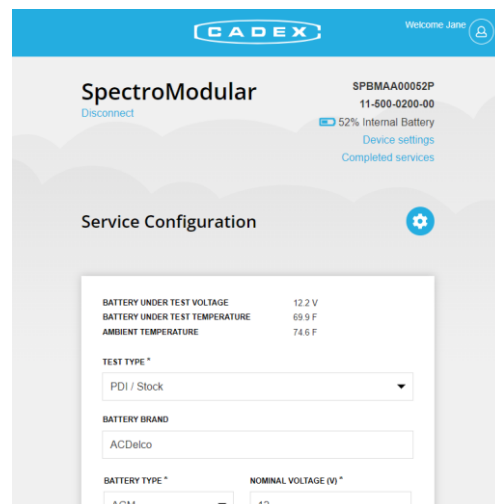
- 1 Enter parameters
- 2 Begin service
- 3 Review results

Configure Service

▼To configure a service or test session:

1. If necessary, navigate to Device Settings page, and select **New Service**.

The Service Configuration page appears.



The screenshot displays the CADEX SpectroModular interface. At the top, the CADEX logo and user name 'Welcome, Jane' are visible. Below this, the device name 'SpectroModular' is shown with a 'Disconnect' button. To the right, device ID 'SPBMAA00052P' and '11-500-0200-00' are listed, along with a battery status indicator '52% Internal Battery' and links for 'Device settings' and 'Completed services'. The main section is titled 'Service Configuration' with a gear icon. A white box contains the following configuration details:

BATTERY UNDER TEST VOLTAGE	12.2 V
BATTERY UNDER TEST TEMPERATURE	69.9 F
AMBIENT TEMPERATURE	74.6 F
TEST TYPE *	PDI / Stock
BATTERY BRAND	ACDelco
BATTERY TYPE *	AGM
NOMINAL VOLTAGE (V) *	12

2. Enter the requested test parameters as configured. They may include:
 - Test Type (customer used | PDI / Stock)
 - Customer used selection will include RC test
 - PDI / Stock will not test RC since the vehicle has not operated long enough to fully charge the battery.
 - Battery Nominal Voltage
 - Battery Type (Flooded, AGM, Sealed, VRLA, Gel, EFB)
 - Battery brand (free text)
 - Reserve Capacity (RC) Units (Minutes, Ah)
 - RC Value
 - Cranking Units (CCA-SAE, EN, DIN, IEC, BCI, MCA)
 - CCA Value

- Vehicle Mileage Value
- Mileage Units (Miles, Kilometers)
- Temperature Units (degrees C, degrees F)
- VIN or Battery S/N selection
- VIN or S/N value (free text)
- Work Order Number
- Technician ID
- Dealer ID

See the advanced setting section for information on how the administrator may make fields above visible or hidden as needed.

Begin Service


▼To begin service:

1. Select **Begin Service**.

The screenshot shows a web form for starting a service. It includes the following fields and values:

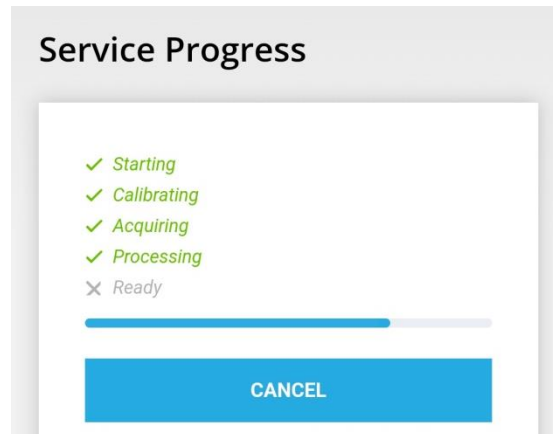
- CCA ***: SAE (dropdown), 300 (text)
- VIN/SN # ***: VIN # (dropdown), VIN (text), QR icon
- VEHICLE MILEAGE ***: 123000 (text)
- WORK ORDER NUMBER**: 4D56G46D (text)
- TECHNICIAN ID**: 45d31d (text)
- DEALER ID**: d45f64d (text)

A blue button labeled "BEGIN SERVICE" is located at the bottom of the form.

A solid green LED above the power button  on the Spectro unit indicates that the test has begun. It will remain on for the duration. The green LED turns off once the test is completed. The LED will turn red if the battery under test has failed.

Note: Do not remove the clamps during battery scan.

Test duration is typically 30 seconds. Progress is displayed in Cadex Link similar to the image below.



The test result displays below the test progress indicator section.

TIME Nov 7, 2023 07:40
VIN/SN # -
BATTERY TYPE AGM
TEMPERATURE 15.0 C
BATTERY BRAND LEJ
WORK ORDER NUMBER 1205
TECHNICIAN ID/NAME MM
DEALER ID/NAME -
WARRANTY ID X2XBT0PVHQRRA
FINAL RESULT **GOOD BATTERY**

PARAM	MEASURED	RANGE	RESULT
OCV	12.955V	12.2V - 13.4V	Good
SOC	100%	49% - 100%	Good
CCA	1000A	430A - 860A	Good
Rated Capacity	Good	>40%	Good

UPLOAD RETEST

▼To return to the *Service Configuration* page:

Select **Retest**.

▼To upload results:

If WiFi is connected, and if logged in to the Cadex Cloud account, results can be uploaded by selecting UPLOAD. See the section “Create a Cadex Cloud Account” for details.

Note: Upload to Cadex Cloud can only be initiated through the Cadex Link application.

Next, follow up with post-test procedures, such as printing.

Managing Battery Test Results

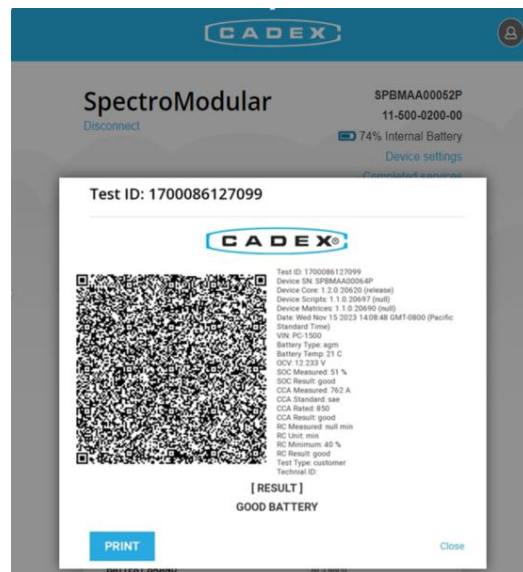
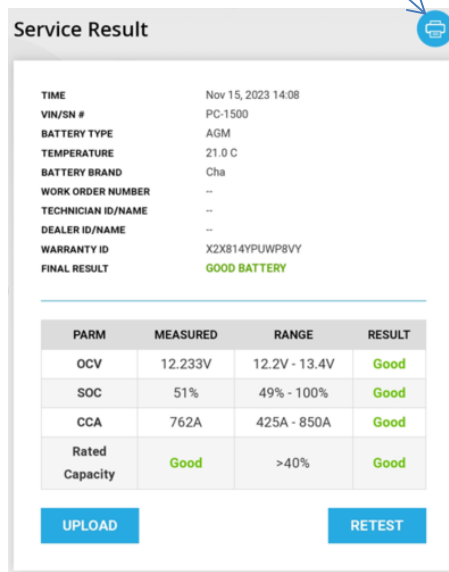
Battery service test results are automatically saved in the Spectro Modular’s internal memory. Service test results can be printed for each battery test.

Print Battery Service Results

Using Cadex Link, test results can be printed, using a WiFi printer on your local network.

▼To print service test results:

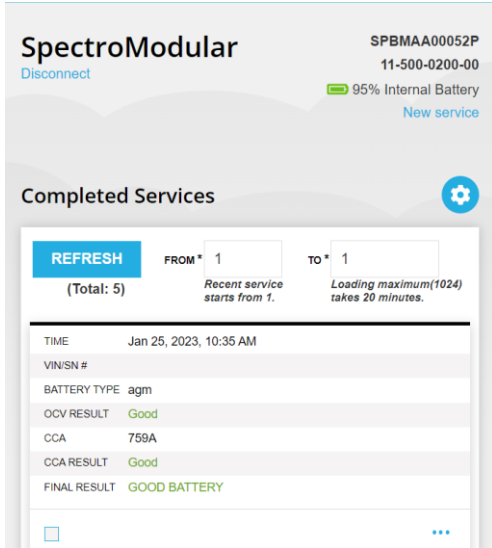
Select **printer icon** on the top right side of the service results screen.



A service results summary report will appear. Tap on the PRINT button to send the test result image to a printer available from the host.

Completed Services Report

The completed services report can be reviewed by navigating to "Completed Services" link on the upper right-hand side in the Service Configuration page.



The screenshot displays the SpectroModular interface. At the top, it shows the device name "SpectroModular" with a "Disconnect" link. To the right, the device ID "SPBMAA00052P" and phone number "11-500-0200-00" are listed. Below this, a battery status indicator shows "95% Internal Battery" with a green bar and a "New service" link. The main section is titled "Completed Services" and features a settings gear icon on the right. Below the title is a "REFRESH" button and a "(Total: 5)" indicator. There are also "FROM" and "TO" filters, both set to "1". Below these filters, a table displays service details:


TIME	Jan 25, 2023, 10:35 AM
VIN/SN #	
BATTERY TYPE	agm
OCV RESULT	Good
CCA	759A
CCA RESULT	Good
FINAL RESULT	GOOD BATTERY

At the bottom of the table, there is a checkbox on the left and a three-dot menu icon on the right.

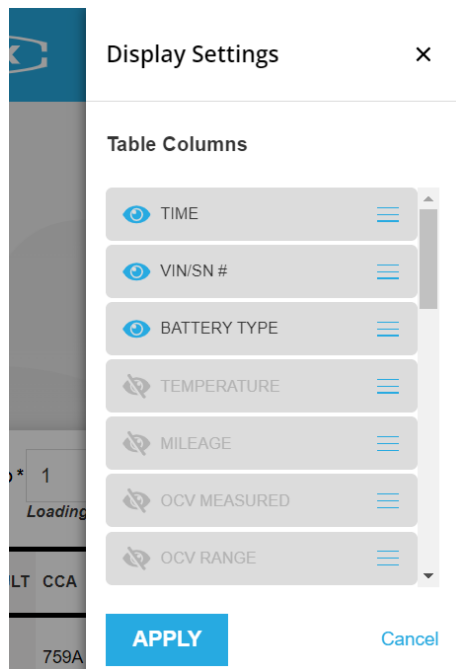
Spectro Advanced Set up

Display Settings

The Settings icon allows an administrator or operator to control the display of service report fields. Table entries and column properties can be adjusted.

Select the **Settings** icon  found on the right-hand side above the completed service table.

Select to show or hide fields that require entry, and whether they will appear in the results report. Press, hold and drag to rearrange the order of the fields in the results report.



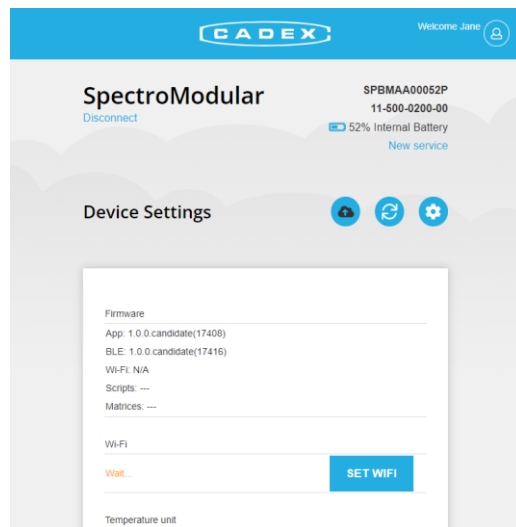
Once adjustments are made, select APPLY to save the settings. Every time this host opens Cadex Link connecting to a Spectro *Modular* it will remember these settings.

Connect Spectro *Modular* to Wi-Fi

▼To connect to Cadex Cloud via Wi-Fi:

1. Navigate to Cadex Link *Service Configuration* page and select **Device settings**.

This displays the *Device Settings* page.



2. Tap on SET WIFI and enter the Wi-Fi credentials for the network the Spectro *Modular* is to join.
3. Select **Save**.

Note: The Wi-Fi LED on the Spectro unit will indicate solid green upon successful Wi-Fi connection.

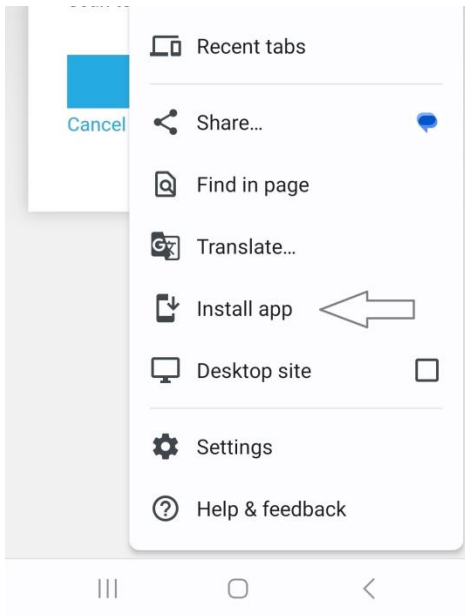
Provided a Cadex Cloud account is created, the Wi-Fi connection will allow uploading of battery test results so that Spectro *Modular* saved results can be reviewed as part of your organization's data analytics and Fleet Management activities.

Install Cadex Link for offline use

The Cadex Link application can operate while internet-connected, or while offline. No additional equipment, tools, or software is required for the host set-up and installation.

To install Cadex Link for use in offline mode, ensure the host is connected to the internet, open the web browser, and navigate to the Cadex Link URL: www.cadexlink.com.

In the browser, tap on the menu icon (...) and select “install app”.



Note: While operating in offline mode, some functionalities may not be available especially the ability to upload test data to the Cloud.

Create a Cadex Cloud Account

Cadex Cloud offers additional features for Spectro *Modular* including:

- Ability to upload data to store reliably in the Cloud
- Ability to see aggregate data for multiple Spectro *Modular* units, and multiple battery test sessions

▼To create an account:

1. Launch Cadex Link on your host.
2. Select the user icon in the upper right side of the screen.
3. The Cadex Cloud login screen will appear
4. Select **Create** an account.

CADEX

Cadex Cloud login

Please login to your account below.

EMAIL *
Your email

PASSWORD *
Password

LOGIN

[Forgot password?](#)

[No account? Create an account.](#)

[Learn more about Cadex Cloud](#)

5. Enter desired credentials.

CADEX

Create An Account

Please enter your details below.

FIRST NAME *
Your first name

LAST NAME *
Your last name

COMPANY NAME
Your company name

EMAIL *
Your email

PASSWORD *
Password

- × Min 12 characters
- × At least 1 uppercase character
- × At least 1 lowercase character
- × At least 1 number
- × At least 1 symbol

REGISTER

All Fields marked with an asterisk must be filled in. The email and password will be used to login in the future.

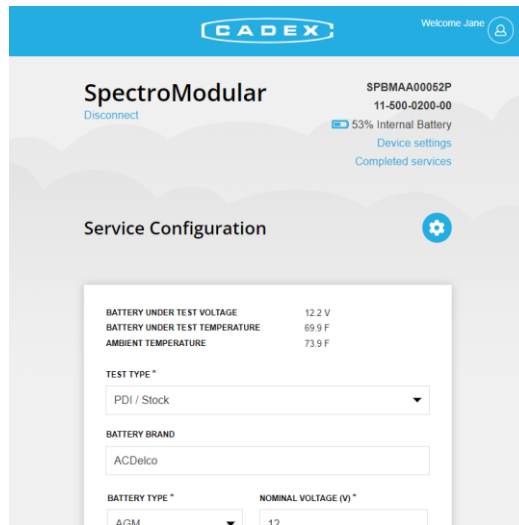
6. Select **Register**.

Once your organization administrator approves your request, a verification email will be sent to the email address provided.

7. In your email account, open the verification email, and select to verify your “Cadex Cloud” account registration request.
8. Enter your credentials.
9. Select **Login**.

Note: The Cadex Link application now has full functionality

When signed in to Cadex Cloud, your name is displayed beside the user icon.



Set Cadex Cloud as Homepage

▼ When using a dedicated mobile device or tablet, set Cadex Cloud as your homepage:

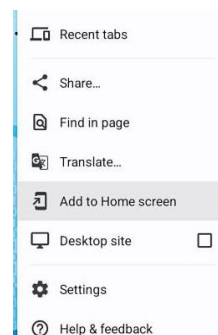
Open a supported web browser using your mobile device

Navigate to **<https://www.cadexcloud.com>**.

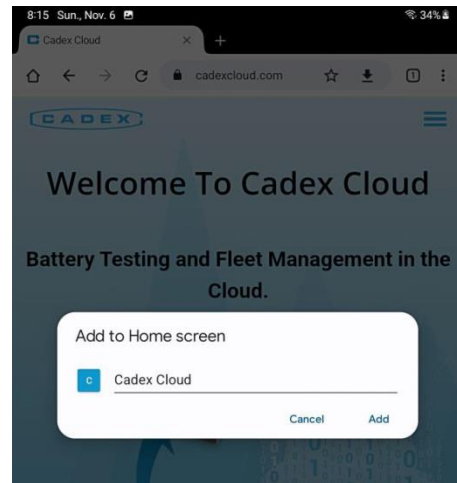
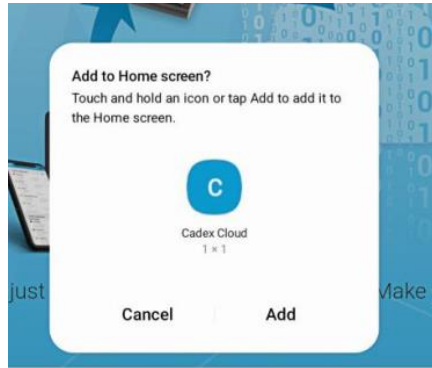
A page similar to below will appear:



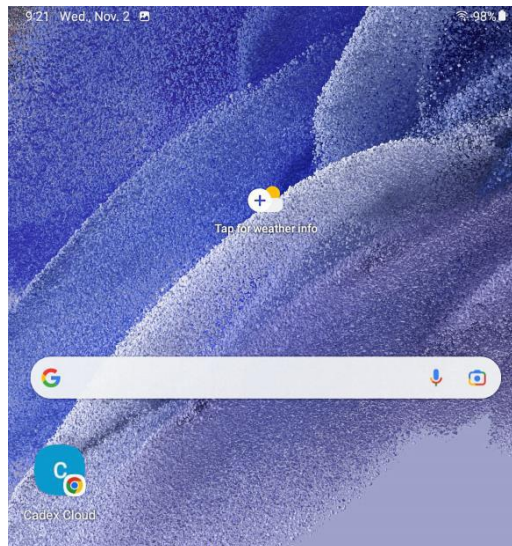
In the browser's menu select **Add to Home screen**.



Follow the prompts to complete adding the icon. Depending on the browser, screens like below may appear.



The Cadex Cloud icon is now saved on your mobile device's homepage.




To launch “Cadex Cloud”, press the Cadex Cloud icon.


When using a PC, tablet or mobile phone, to launch Cadex Cloud navigate to www.cadexcloud.com on a supported browser.

Sleep Mode and Wake-up


▼To power off:

Press and hold the power button  for 3 seconds to completely power down the Spectro *Modular* unit.

▼To enter sleep mode:

Press and release the  power switch to put the Spectro unit into sleep mode. Sleep mode lasts three hours. It will power off completely after that time if no action taken.

▼To wake up:

If the EIS-Powered Rapid Battery Tester is in sleep mode, a Bluetooth pairing request from the mobile device or host will wake it up. If the Spectro unit does not appear on the Bluetooth pairing list in Cadex Link, press  on the unit to power it on.

Maintenance

Equipment Maintenance & Cleaning

▼To clean the Spectro *Modular* EIS-Powered Rapid Battery Tester:

1. Prior to cleaning, ensure the unit is powered off.
2. Disconnect the clamp cable.
3. Clean the equipment at the end of the service with cleaning wipes or agents commonly used in automotive industry. 70% isopropyl alcohol is recommended.
4. Do not use any cleaning solution on the clamps. Wipe the clamps with a **clean** cloth.
5. Spectro *Modular* does not emit any harmful fumes or gases

Equipment Storage

The following storage configuration applies to long-term (> 3 months) storage or for transportation condition.

▼To store the Spectro *Modular* EIS-Powered Rapid Battery Tester:

1. Power off the equipment.
2. Remove the clamp cable
3. Clean the parts
4. Place the unit, clamp cable, and power supply into the unit case.



Warning/Caution:

- Do not carry the Spectro *Modular* by the clamp cable.

Charging the Internal Battery

To charge the internal battery, connect the power supply USB cable to the Spectro via the USB-C connector, and plug the AC power cable into an outlet. It takes about three hours to fully recharge the battery.

The internal battery is designed to operate for several years. Email service@cadex.com to obtain instructions for how to return the Spectro for battery replacement.



Warning/Caution:

- Do not attempt to replace the internal battery yourself. The internal battery can **only** be replaced by a Cadex authorized service center.

Replacement

Except for battery clamp cables, Spectro *Modular* does not have any field replaceable parts. If the unit or any accessories including the internal battery are considered non-functional or operate abnormally, contact Cadex support by email: service@cadex.com.


Troubleshooting

▼To reset Spectro Modular:

If the Spectro *Modular* stops operating or does not respond to any input during a firmware upgrade, reset it:

- Disconnect unit from the battery under test and the power supply.
- Turn off the unit by holding down the power button for 3 seconds.
- Open the rubber cover and locate the recessed reset button next to the USB type-C connector.
- Use a pen to press and hold the button for at least 15 seconds. The battery state LED will light when the button has been pressed for long enough.

▼To reset Bluetooth connection:

Press and hold  for at least 1 second to reset Bluetooth connection.

5


Regulatory Information & references


Technical Specifications

Type	Specifications
Equipment Name	Spectro <i>Modular</i>
Model	SPB16
Part Number	11-500-0201-00
Input Voltage	5.0 VDC
Input Current	3A Max
Battery Test Voltage Range	1.0 to 16VDC
Records Storage	Greater than 1000 service records
Operating Environment (recommended)	Temperature: -10°C to +45°C (14°F to 113°F) Humidity: 10% to 80%
Storage Environment Short-term (up to 30 days)	Short-term (up to 30 days) Temperature: -20°C to +30°C (-4°F to 86°F) Humidity: Non-condensing
Storage Environment Long-term (longer than 30 days)	Long-term (longer than 30 days) Temperature: -20°C to +25°C (-4°F to 77°F) Humidity: Non-condensing
Net Weight	430 g (15.17 oz) excluding clamp cable
Size	Spectro unit: 182mm x 93mm x 47mm (7.17" x 3.66" x 1.85") Clamp Cable: 1m (3.28ft)
Supported Lead-Acid Battery types	Flooded, Sealed, VRLA, AGM, GEL, EFB Sizes: 300 – 1250 CCA, and 55 – 250 (27-125Ah) RC
Power Supply	Power Supply AC Adapter Input: 100-240VAC, 50-60 Hz, 0.6A Output: 5.0V, 1.5A Q-NA, Q-EU
Ingress Protection	IP42
Grounding	F1 Class II / Double Insulated

Type	Specifications
Safety Standards	Compliance IEC 61010-1
Flame Class Rating	UL94 V-0
Overvoltage Category	Category I
Pollution Degree	II

Labels




SPECTRO MODULAR
EIS-Powered Rapid Battery Tester
MODEL: SPB16
INPUT: MAX 5.0V DC 3A 
OUTPUT: MAX 16.0V DC 1.5A 


CONTAINS FCC ID: X8WBM832
CONTAINS FCC ID: 2AC7Z-ESP32WROOM32E
CONTAINS IC: 4100A-BM832
CONTAINS IC: 21098-ESPWROOM32E




Intertek
9700174



CERTIFIED/CONFORMS TO
CSA C22.2#61010-1-12:2012
UL 61010-1-12:2012

 **CADEX ELECTRONIC INC.**
22000 FRASERWOOD WAY
RICHMOND BC
WWW.CADEX.COM
MADE IN CANADA

INDOOR USE ONLY
READ INSTRUCTIONS BEFORE USE


Regulatory Declaration

Spectro *Modular* complies with the essential requirements of the following applicable European Directives:

- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Low-Voltage (Safety) Directive 2014/35/EU
- RoHS Directive 2011/65/EU, and its amendments

Note: Please contact Cadex Electronics Inc. for more details on the compliance standards or to request a copy of declaration of conformity.



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