

Mits10 Manual 3.0.0

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Introduction

About This Manual

Welcome to the Mits X manual, your introduction and guide to using the most powerful battery test equipment on the market. With step-by-step instructions, this manual will help you to understand the basics of our test equipment hardware, the Mits X software interface, and Arbin Instruments' data tools. With the Mits X software manual as your guide, you can quickly get started with your testing and researching.

This manual provides a comprehensive guide to the core elements of the Arbin battery testing ecosystem. If at any time you have questions about our test equipment or the Mits X software, please contact Arbin Instruments directly using the details below.

Arbin Instruments	In China
Phone: (979) 690-2751	Phone for Northeast China, North China, Northwest China, East China, Central China: 022-86330901/0902
Fax: (979) 690-2761	
Email: support@arbin.com	Phone for South China, Southwest, Hong Kong, and Macau: 020-84219506
Website: High Precision Battery Test Equipment Arbin Instruments	

General Safety Information

The following safety guidelines help to ensure the safety of yourself and others as well as protect your Arbin battery testing equipment and work environment from potential damage.

	WARNING: The end user is responsible for performing the appropriate tests for the specific device under test and to be aware of any characteristic or possible hazards (fire, explosion, burns, electrolyte exposure, etc.) the device under test may pose.
	WARNING: Do not operate the Arbin battery test equipment outside of its published voltage and current specifications. If the Arbin equipment is operated outside of its specified voltage and/or current ranges, the protection circuits for the device under test and the Arbin chassis may be impaired. Refer to the SN product record or the label on the chassis for these specifications.
	WARNING: For safety reasons, only use Arbin-approved accessories with your Arbin battery test equipment.
	WARNING: Do not replace the main chassis power cord with an inadequately rated power cord. To prevent electrical hazard, connect the instrument to an electrical outlet using a three-prong socket for proper grounding.
	WARNING: Do not expose the Arbin battery test equipment to moisture, liquid, heat, or corrosive vapor.
	WARNING: Do not operate your equipment with any covers removed. This includes computer covers, bezels, filler brackets, front-panel inserts, etc.
	WARNING: Fans mounted to the front of the Arbin unit pull air into the chassis. Loose clothing or objects can be pulled into the fan assembly.
CAUTION Two person lift	CAUTION: For systems weighing more than 18 kg and less than 35 kg, please use a two-person lift.

New in Mits X

The latest version of Arbin's Mits X software offers several new features to enhance your battery testing operations. These added and upgraded features include:

1. Comprehensive user management with 4-level user permissions (Chapter 4)
2. User-friendly wizard to facilitate the creation of new Schedule files (Chapter 6)
3. Schedule Snippet Library for efficient re-use of Schedule components (Chapter 6)
4. Customizable plot templates and the ability to view multiple plots in real-time (Chapter 9 and Chapter 10)
5. Compatibility with Schedule Files from Mits Pro 8.

1: System Requirements and Installation

1.1 Installation Information

1.1.1 System Requirements

Operating System	Interfaces 10 English, 64-bit
System Environment	.NET Framework 4.6.1 or higher
Memory	8 GB and above

1.1.2 Connection Details

1. Set the TCP/IP Address:
 - a) The local console connects to WinDaq using 127.0.0.1.
 - b) The remote console connects to WinDaq using the LAN IP address.
 - c) The network card address of WinDaq connected to the Arbin cycler is configured as 196.168.1.100.

1.2 Install Mits X

There are currently two options for installation Mits X, package installation and free installation. The following instructions cover the steps for both installation options.

1.2.1 Package Installation

1. Unzip the Mits X installation package.
2. The Mits X installation package has four primary components:
3. Setup.exe - The installation program.
4. Arbin MySql_Auto – Required files for the MySQL software.
5. SQLEXPRAADV_x64_ENU – Required files for the SQL Server software installation, including automatic installation scripts and custom installation software.
6. README.Text
7. Run the Mits X Installation Wizard.
 - a) Double-click on Setup.exe to enter the Mits X Installation Wizard.

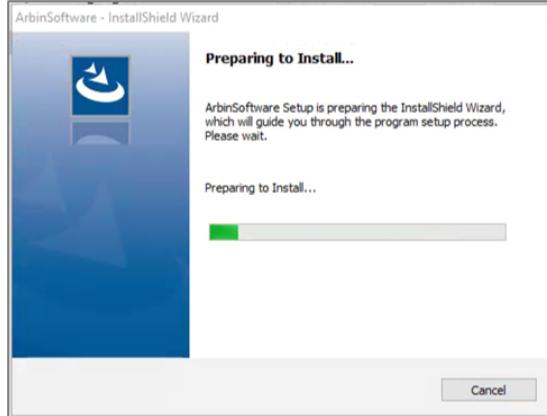


Figure 1-1 Mits X Installation Wizard

b) Click "Next" on the bottom right of the Installation Wizard.

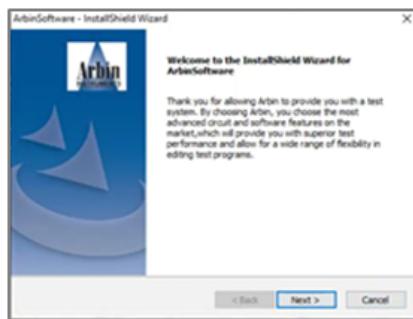


Figure 1-2 Starting the Mits X Installation

c) Read the license terms, select "I accept the terms of the license agreement," and click "Next" to proceed with the installation.

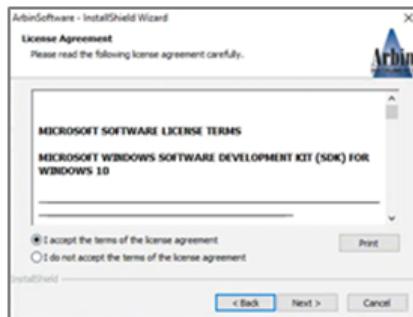


Figure 1-3 Mits X Installation License Agreement

d) Complete the Environment Check.

i) This step confirms that the computer meets the requirements for installing the Mits X software. These requirements are:

- (1) Interfaces 10, 64-bit operating system
- (2) English language system
- (3) .NET Framework of 4.6.1 or higher
- (4) RAM memory of 8 GB or above

ii) If any of the conditions are not met, the installation cannot be completed.

e) Once the Environment Check is complete, click "Next" at the bottom right of the Interface to go to the next step.

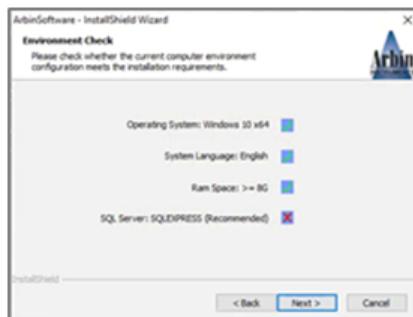


Figure 1-4 Mits X Environment Check

f) Choose the installation mode, Complete or Custom.

i) Complete installation installs Console, WinDaq, and SQL Server, and will save the installation content in the default path.

(1) Select the "Complete" installation option.

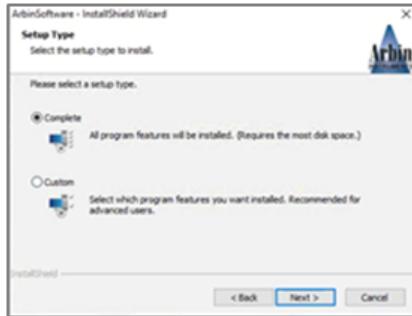


Figure 1-5 Select the Complete Installation Option

(2) Review the installation details, then click the "Install" button on the lower right of the Installation wizard to start the installation.

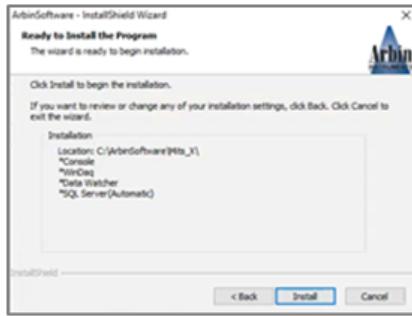


Figure 1-6 Complete Installation Details

g) Complete the installation.

i) Wait for the installation process to finish.

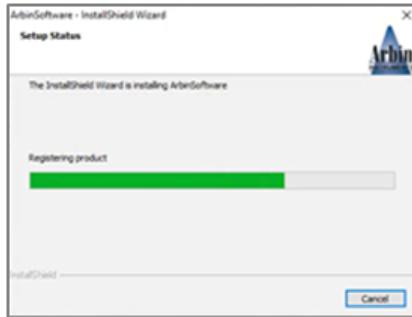


Figure 1-11 Mits X Installation in Progress

ii) Click the "Finish" button to exit the Mits X Installation Wizard.

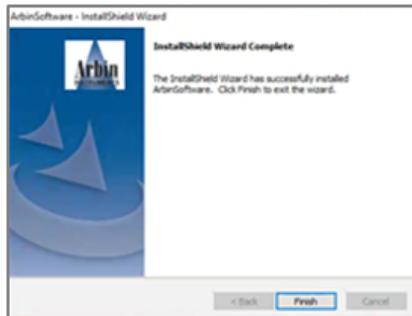


Figure 1-12 Completed Mits X Installation

1.2.2 Free Installation

1. Make sure that computer meets the Mits X software requirements:
2. Interfaces 10, 64-bit operating system
3. English language system
4. .NET Framework of 4.6.1 or higher
5. RAM memory of 8 GB or above

6. Copy the Mits X directory from the installation U disk to the computer.

7. You can now use the Mits X directory directly.

1.3 Uninstall Mits X

Choose Your Uninstall Method:

1. Uninstall using Uninstall ArbinSoftware.

a) Double-click on the "Uninstall ArbinSoftware" icon to open the Uninstall Wizard.

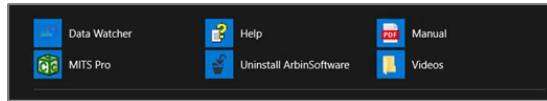


Figure 1-12 Uninstall ArbinSoftware Icon

b) Click "Yes" on the Wizard to confirm the uninstall of Mits X.



Figure 1-13 Confirm Uninstall of Mits X

2. Uninstall using Setup.exe.

a) Double-click "Setup.exe" to open the option interface.

b) Select "Remove" from the options that appear in the Wizard, then click "Next" to proceed with the uninstall.

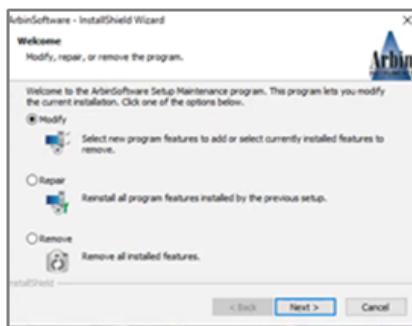


Figure 1-14 Select the Remove Option to Uninstall Mits X

c) Click "Yes" on the Wizard to confirm the uninstall of Mits X.

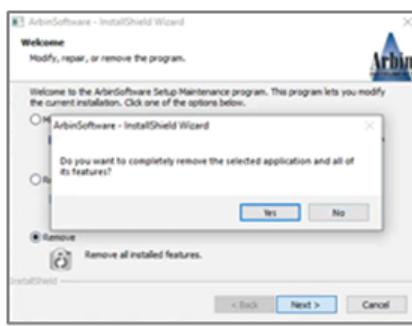


Figure 1-15 Confirm the Uninstall of Mits X

d) After the uninstall process is complete, click the "Finish" button to exit the Wizard.

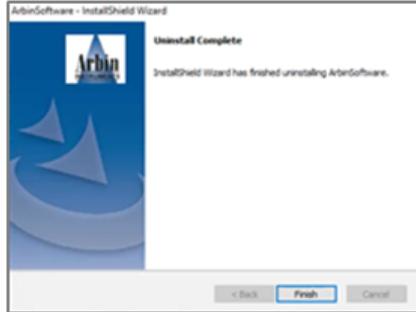


Figure 1-16 Completed Uninstall of Mits X

2: Initial Setup

Thank you for choosing Arbin Instruments for your battery test equipment. Arbin offers the most advanced circuits and software functions on the market, to provide you with excellent test performance and extensive flexibility for editing test programs. Arbin Instruments designs test platforms for every specific application; please refer to **Appendix A: Control Type Function Descriptions** to review the available control types and voltage/current specifications.

2.1 Set Up the Equipment

Each Arbin battery tester has been thoroughly tested, calibrated, and fully loaded with burn-in operations in the factory. However, equipment sometimes encounters rough handling during transportation. Please take a few minutes to complete the inspection procedures below to ensure that your Arbin battery test equipment is undamaged and ready to run your tests.

2.1.1 Inspect the Equipment

1. Make sure that the Arbin equipment is not plugged in while you perform the inspection.
2. Complete the following inspections before starting your Arbin battery test equipment.
3. Check all packages for external damage before opening. If the warning on the package shows obvious damage or signs of damage, it should be reported to the shipping company immediately.
4. Confirm that the thumbscrews of all boards and modules are firmly tightened to the front of the chassis.
5. Remove the panel covering the microcontroller board (the blank panel attached with Philips screws, inserted between 3-5 channel board groups).
6. Press the board firmly to ensure firm contact with the back BUS board.
7. Ensure that the Ethernet connector (if included with your Arbin tester) is firmly attached on the front panel of the test bench.
8. Check for any obvious signs of transportation damage to the main components of the test bench cabinet.
9. There should be no visible damage to the outside of the test bench or the computer equipment.
10. There should be no visibly or audibly loose parts inside the test bench chassis or PC.
11. The circuit board should be in a vertical or horizontal orientation.
12. An inclined orientation of the circuit board indicates that the system has been severely dropped or treated roughly during transportation, resulting in damage to the circuit board mounting components or tracks.
13. The connection between each circuit board and the backplane should ensure that the electrical and communication signals have solid contact.

2.1.2 Assemble the System

1. Connect the main components of the system.
2. Connect the Arbin case and computer to an appropriate power source.
3. Please note that cabinets and computers may have different power supply voltage ratings (220V or 208V and 110V).
4. Connect the computer's Ethernet cable (TCP/IP) to the front of the Arbin test equipment chassis.
5. If a different connection scheme is required, it will be provided.
6. Connect other computer components, including monitors, keyboard, mouse, speakers, and UPS (if included).

 Under no circumstances should users install any third-party UPS management software. Mits X includes its own power failure trigger; the presence of any other utility program will impair the system's ability to detect failures and respond appropriately when shutting down or recovering from a test. For more information, please refer to **19.2 UPS**.

7. Connect the computer's Ethernet cable (TCP/IP) to the front of the Arbin tester.

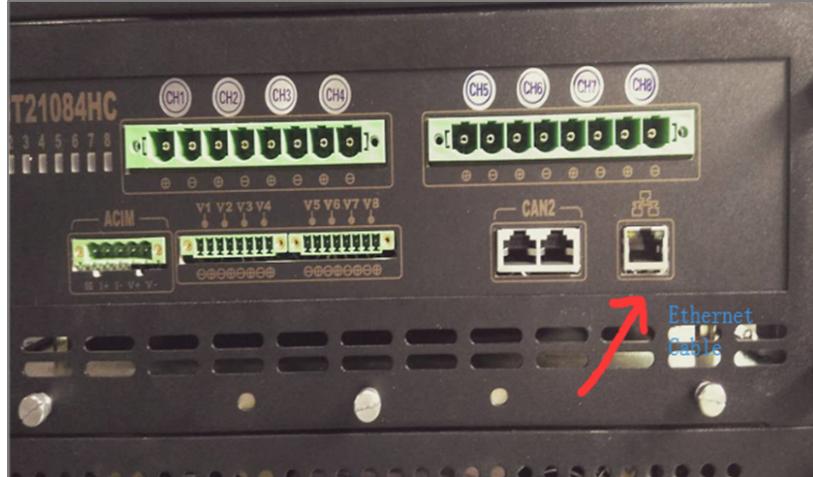


Figure 2-1 Ethernet Port on an Arbin Tester

8. Connect the battery cables. For a detailed explanation of battery cable connection methods, please refer to **18.1 Hardware Structure**.

9. Review the system specifications.

Note: It is very important to understand the specifications for the main channel current/voltage, auxiliary channel, additional functions, and test bench power. The above rated specifications are listed on the label on either the front or the back of your Arbin battery test equipment. The image below shows a blank version of the specification sheet.

CUSTOMER ORDER SPECIFICATION SHEET

The following are the specifications of the Arbin unit. Please plan accordingly to prepare for the arrival of the unit.

CUSTOMER:	
System Serial No. :	
Model:	
Est. Delivery Date:	

Current & Voltage Channel Specifications

CH No.	IH Range	IM Range	IL Range	V Range H/L

Auxiliary Channel & Additional Function Specifications

CH No.	Second Voltage	Temperature	Pressure	High Speed Pulse	ACIM

Chassis Dimensions: _____ W x L x H: (Inch) _____

Power Requirements: _____

Single-Phase: (V)		Max. Power: (VA)	
Three-Phase: (V)		Max. Power: (VA)	
Power Socket Requirements:		Refer to specification Sheet attached.	
<hr/>			
Notes:			
		For 3-phase Y-connected power supply, please ensure the following Voltages: V _{Phase} - V _{Ground} = 110V (for all three phases) *V _{phase} - V _{phase} = 208 V (for all three phases)	
		*The unit can also be configured to run at 208V three-phase if your facility requires that configuration. Please let us know immediately if that is your requirement	

2.2 Set Up the Mits X Software

⚠ Interfaces 10 and Mits X have been pre-installed on the computer. Please do not reinstall any Microsoft or Arbin software without the permission of Arbin Customer Support.

2.2.1 Open the Mits X Program.

1. Start up the computer and Arbin battery test equipment.
 - a. Power on the Arbin battery test equipment and the computer.
2. Log into the computer.
 - a. Enter the username "Arbin" and password "arbin" to access the Interfaces desktop.
 - b. If this username and password does not work, contact Arbin Customer Support for the appropriate password.
3. Double-click the "WinDaq.exe" icon to display the WinDaq page of Mits X. The user program appears as an interface application.



Figure 2-2 The WinDaq.exe Icon

4. Double-click the "Console.exe" icon to display the Mits X login interface.



Figure 2-3 The Console.exe Icon

ℹ For information on user permissions levels, refer to [Chapter 4: User Accounts and Permissions](#).

2.2.2 Log into the Mits X Software

Open the Login Interface

1. Click on "Login" on the Mits X menu.
2. Click on the "Login" icon to open the Login Interface.

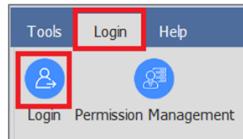
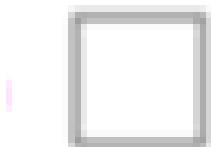


Figure 2-4 Login Button and Login Icon

Complete the Login Interface Fields



P



Remember me



Figure 2-5 Mits X Login Interface

1. Fill in the IPv4 address of the computer you are using to run Mits X.
2. Fill in the username.
3. Fill in the password.
4. Select whether to automatically login with the entered information.
5. Select whether Mits X should store your password for the next time you login.

2.2.3 Register Your Mits X Software

Registration is required to perform normal test functions within Mits X once the trial period has expired.

1. Click on "Help" on the Mits X menu.
2. Click on the "Registered" icon to open the Registration Interface.

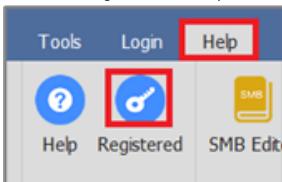


Figure 2-6 Registered Icon

3. Choose your registration method: Use Registration File or Use Registration Key.

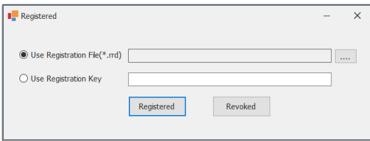


Figure 2-7 Registration Interface

4. Fill in the corresponding information for your selected registration method.
5. Click the "Registered" button to register the Mits X software or click the "Revoked" button to cancel the software registration.

2.3 Test the Equipment

2.3.1 Set Up the Diagnostic Test

Arbin Instruments recommends each new installation start with a diagnostic test. This test should be completed to verify the performance of the new system before analysing any propriety or non-standard samples.

The diagnostic test requires a resistor with bipolar current and power ratings to diagnose the instrument, or a battery to diagnose the system and check specific indicators. Each type of resistance or battery test object can be located in the special diagnostic test program, which is stored in the "qc" directory of the hard disk where the Mits X program files are located (C:\ArbinSoftware\qc-xxxx, where "xxxx" is typically the serial number).

1. Connect the resistor or resistors.
 - a. If a resistor with an appropriate load value is available, connect it to a physical channel on the battery tester chassis.
 - b. If several such resistors are available, connect them to different chassis, models, and units as needed.

The power range of Arbin's custom-designed test equipment ranges from under one watt up to hundreds of kilowatts. Arbin uses a diverse range of circuits to design these systems, then thoroughly tests them at the factory. The details and results of these testing programs are stored on the Arbin-provided PC and the USB flash drive included with this manual. We have also included a separate document that describes the equipment used to perform specific tests on your Arbin battery test equipment.

You can run your own performance tests by copying our test conditions. You will then be able to compare the results data with the data generated by Arbin to ensure accurate functionality.

Along with testing details and results, the USB flash drive includes a backup of the Mits X software. The flash drive should have the serial number of your particular battery test equipment on it, written on a white label. If you cannot locate the testing program details in either of these two places, please contact Arbin Customer Support.

For details on creating and editing Schedules, refer to **Chapter 6: Schedule Files**.

1. Set up the program for the diagnostic test.
2. Locate the file "ab-funsc.sdx" in the "C:\ArbinSoftware\qc-xxxx" folder.
3. Copy the file to the "C:\ArbinSoftware\Mits X\WinDaq\Work" folder.
4. Connect the testing device to the system.
5. To use a suitable device for this test, open the test Schedule and click the "Global" tab.
6. The section labeled "Information/Comments" describes the devices used to test your equipment at Arbin.
7. Connect the testing device to each channel of the system to ensure that each board is working properly.

2.3.2 Run the Diagnostic Test

1. Start the diagnostic test.
 - a. Select the schedule name in the Mits X console.
 - b. Right-click to assign "ab-funsc.sdx+TestObject.to" to the channel connected to the test object. (For more information, refer to the distribution test procedure in [6.2 Manage Schedule Files](#).)
 - c. On the monitoring and control Interface, select the channel that has been loaded with resistance or a battery.
 - d. Click the "Start" button. (For more information, refer to [10.2 Manage Tests with the Monitor Toolbar](#).)
2. Run the diagnostic test.
 - a. In the startup dialog box, enter the "funsc" as the result file name.
3. If "UNSAFE is not safe" appears after the second step of "Current Ramp," please check the battery voltage and the connection with the chassis.
4. The test result data should be similar to Figure 2-8 below, although different systems will have different values. If the data differs from this graph, please save a copy of the graph and contact Arbin Customer Support.

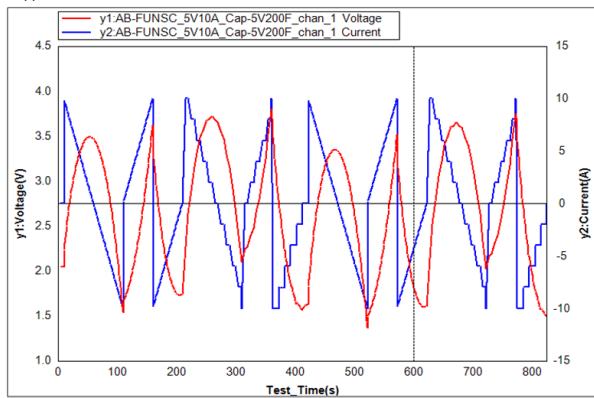


Figure 2-8 Function Test Current and Voltage Diagram, AB-FUNSC

■ In the rest of the first step of ab-funsc.sdx, the voltage reading on the monitoring and control Interface should be close to the rated voltage of the relevant test battery, or a very small voltage value on the resistor. Otherwise, there is a communication problem between the chassis and the computer. In this case, please contact Arbin Customer Support.

The following is a detailed description of the test program template. The pre-defined program "ab-funsc.sdx" is used to check all standard functions of the Arbin battery testing system, including every available mode of the hardware and software interface. The channel's ability to execute this program is a valuable indicator of the system's normal operation.

■ The maximum current described below is the maximum current of range 1, and the minimum current is the negative value of the maximum current.

1. Rest for 10 seconds.
2. Run a current ramp using Range 1 from the maximum current to the minimum current.
3. Charge using a current ramp from 0 A to the maximum current using Range 1.
4. Discharge using a current ramp from the minimum current to 0 A using Range 1.
5. Run a current staircase from the maximum current to minimum current using Range 1.
6. Run a current staircase from 0 A to the maximum current.
7. Run an internal resistance check on Range 4.
8. Run an internal resistance check on Range 3.
9. Run an internal resistance check on Range 2.
- 10) Run an internal resistance check on Range 1.
- 11) Discharge using a current staircase from the minimum current to 0 A.
- 12) Increment the cycle index and repeat once from the first step.

2.3.3 Turn Off the System

1. Close the Mits X applications, including Console.exe and WinDaq.exe.
2. Shut down the Interfaces operating system.
3. Turn off the power on the computer and the Arbin battery test equipment.

3: Overview of Mits X

3.1 Introduction to the Mits X Software

3.1.1 Mits X Software Composition

The Mits X software has two main components, the server application WinDaq, and the client application Console. The main directories of these two applications contain the important file "ArbinSys.cfg." This file is related to the hardware system configuration and calibration data, which are the basis for test system accuracy.

3.1.2 Mits X File Organization

All test programs and batch files are contained in the C:\Arbinsoftware\Console(WinDaq) directory. The following table includes descriptions and locations for Mits X files.

Directory Name	Location	File Name
----------------	----------	-----------

Console	C:\ArbinSoftware\Console	Console.exe, ArbinSys.cfg, ArbinAdvSys.cfg, ArbinSduModel.xml, ArbinSys.DBCF
WinDaq	C:\ArbinSoftware\WinDaq	WinDaq.exe, ArbinSys.cfg, ArbinAdvSys.cfg, ArbinSduModel.xml, ArbinSys.DBCF
Work Directory	C:\ArbinSoftware\Console(WinDaq)\Work\(...)	All mapping files (*.bth) all schedule files (*.sdx)
Profiles_TestObject	C:\ArbinSoftware\Console(WinDaq)\Profiles_TestObject	all test object files (*.to)
Profiles_ReportChart	C:\ArbinSoftware\Console(WinDaq)\Profiles_ReportChart	all chart files(*.cht)
Profiles_CANBMS	C:\ArbinSoftware\Console(WinDaq)\Profiles_CANBMS	all CAN BMS configure files(*.can)
Profiles_SMB	C:\ArbinSoftware\Console(WinDaq)\Profiles_SMB	all SMB configure files(*.smb)
Profiles_Simulation	C:\ArbinSoftware\Console(WinDaq)\Profiles_Simulation	simulation files(*.txt)
DataWatcher Directory	C:\ArbinSoftware\DataWatcher	DataWatcher.exe
Logs Directory	C:\ArbinSoftware\Console(WinDaq)\Console(WinDaq)\Logs C:\ArbinSoftware\Console(WinDaq)\ReportProblem	All Auto Calibration files, online edited schedule files, Data Log Information file, My Arbin Information files, Report Problems, Schedule online edit Record files, System Version information files, and Temp ChamberData

The system configuration file includes the following:

1. Arbinsys.cfg
2. ArbinAdvSys.cfg
3. ArbinSys.DBCF (SQL database setting)
4. Account Permissions

3.2 Introduction to the Mits X User Interface

3.2.1 The WinDaq Server Software and User Interface

The WinDaq server is mainly an intermediary between the cycler and the Console client. It displays the connection status between WinDaq and the Console client in real time, as well as the connection status between WinDaq and the cycler hardware.

As shown in Figure 3-1, it consists of a toolbar and a status interface.

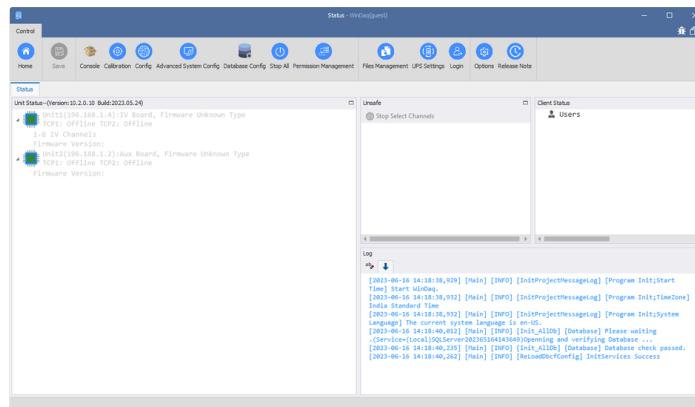


Figure 3-1 WinDaq Interface

The WinDaq Server Software Toolbar

1. Home: Return to the Home page.
2. Save: Save the file content, only available from the File editing page
3. Console (Client Application): Open the client application.

4. Calibration: Open the Hardware Calibration Interface.
 5. Config (Configuration Information): Configure software and hardware device connection information.
 6. Advance System Config: Open the Advanced System Config Interface.
 7. Database Config: Open the Database Configuration Interface.
 8. Stop All: Stop all channels that are currently running tests.
 9. Permission Management: Open the Permission Management Settings Interface.
 10. File Management: Backup and restore the Settings Files.
 11. UPS Setting: Open the UPS Power Configuration interface.
 12. Login: Open the User Login Interface.
13. In the top right corner there are two buttons. The button on the right can be used to check the supported versions of various Arbin software and firmware.



- Supported versions of Following listed softwares will be shown:
 - AcbControl
 - ArbinViewer
 - AutoCalibration
 - AutoExport
 - DBATool
 - DataPro
 - DataWatcher
 - DataWatcherAccess
 - ListenForNet2022

The Status Interface

1. Unit Status: Display the status information of the connected device.

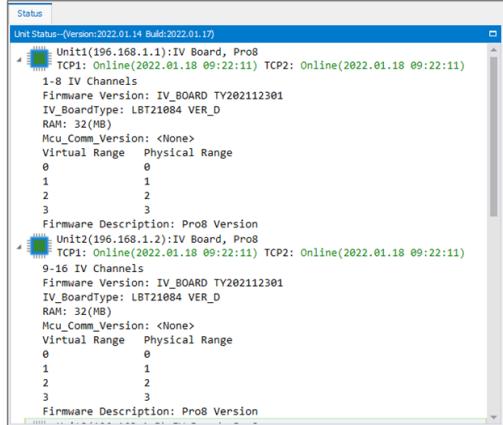


Figure 3-2 Unit Status Interface

2. Client Status: Display the status information of the connection client.

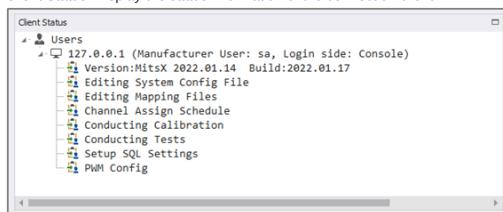


Figure 3-3 Client Status Interface

3. Log: Record the information of the software in use.

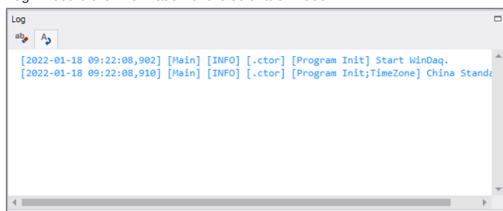


Figure 3-4 Log Interface

3.2.2 The Console Client User Interface

The Console Client user interface provides options for editing files including test programs, target files, report chart files, BMS files, and system configuration files. It also includes options to start and control tests, calibrate hardware, start DataWatcher, and many additional software tools for battery testing.

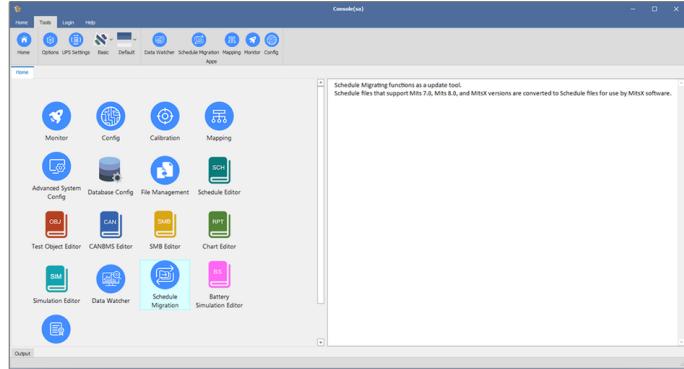


Figure 3-5 The Console Client User Interface

The Menu Toolbar

The Menu Toolbar at the top of the Console Client user interface contains five options: Home, Tools, Login, and Help. The following are the actions for each menu option.

1. The Home Menu
 - a. **Home:** Return to the Home page.
 - b. **Monitor:** Open the Monitor Interface.
 - c. **Mapping:** Open the Mapping Interface.
 - d. **Schedule Editor:** Open the Schedule Editor.
2. The Tools Menu
 - a. **Home:** Return to the Home page.
 - b. **Options:** Manage the display of the Console Client interface.
 - c. **UPS Settings:** Open the UPS Power Configuration interface.
 - d. **Basic:** Change the style of the interface.
 - e. **Default:** Change the colour palette of the interface.
3. The Login Menu
 - a. **Home:** Return to the Home page.
 - b. **Login:** Open the User Login Interface.
 - c. **Permission Management:** Open the Permission Management Settings interface.
4. The Help Menu
 - a. **Home:** Return to the Home page.
 - b. **Help:** Opens the digital version of this User Manual.
 - c. **Registration:** Open the Registration Interface for the Mits X software.
 - d. **Arbin Testing Info:** Shows the test equipment description and specifications.

3.2.3 Mits X User Interface Gallery

1. The **Monitor interface** is used for monitoring and controlling channels.

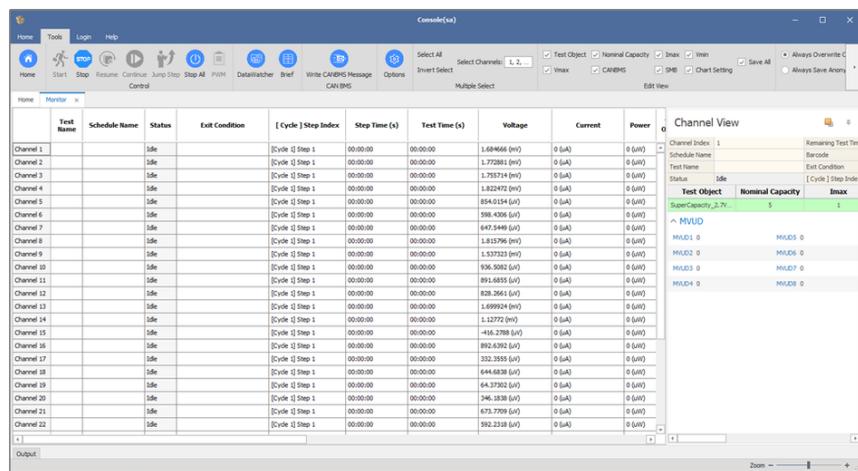


Figure 3-6 The Monitor Interface

The **Config (Configuration) Interface** is used to configure the software and hardware device connection information.

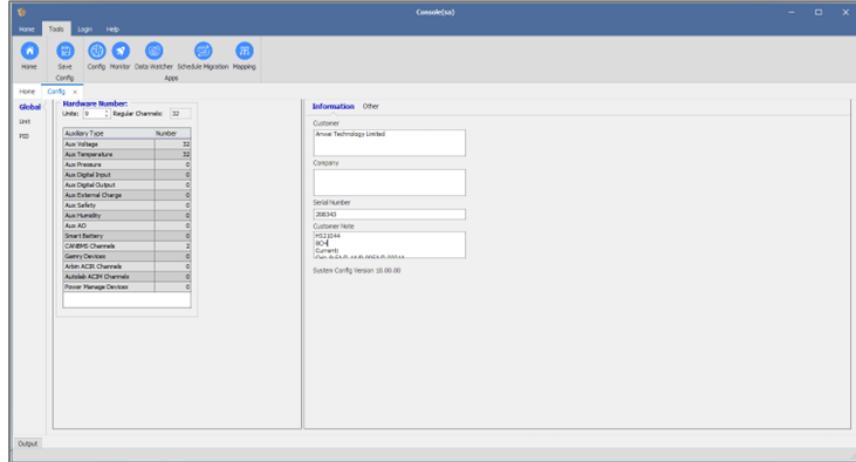


Figure 3-7 The Config (Configuration) Interface

The **Calibration Interface** is used for channel calibration.

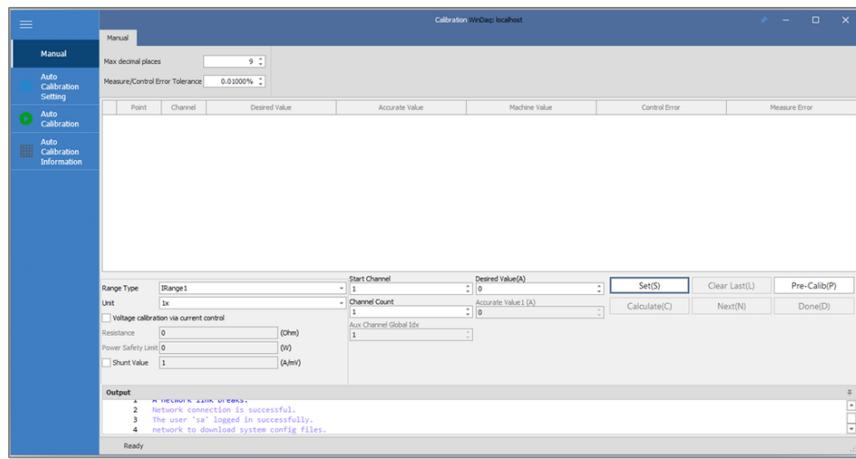


Figure 3-8 The Calibration Interface

The **Mapping Interface** is used to configure the auxiliary information required by the channel. The Mapping file (file extension .bth) provides a mapping page to detail the connection between the main IV channel and the auxiliary channel.

Channel Index	Auxilliary Type	Auxilliary Channel Virtual Index	Auxilliary Channel Global Index	Built-In or Public	Maximum Current(A)	Maximum Voltage(V)	Maximum Power(W)	Unit Index	In Unit Logical Index
> 1					10	5	50		
> 2					10	5	50		
> 3					10	5	50		
> 4					10	5	50		
> 5					10	5	50		
> 6					10	5	50		
> 7					10	5	50		
> 8					10	5	50		
> 9					10	5	50		
> 10					10	5	50		
> 11					10	5	50		
> 12					10	5	50		
> 13					10	5	50		
> 14					10	5	50		
> 15					10	5	50		
> 16					10	5	50		
> 17					10	5	50		
> 18					10	5	50		
> 19					10	5	50		
> 20					10	5	50		
> 21					10	5	50		
> 22					10	5	50		
> 23					10	5	50		
> 24					10	5	50		
> 25					10	5	50		

Figure 3-9 The Mapping Interface

The **Advanced System Config (Configuration) Interface** is used for setting required functions by device series.

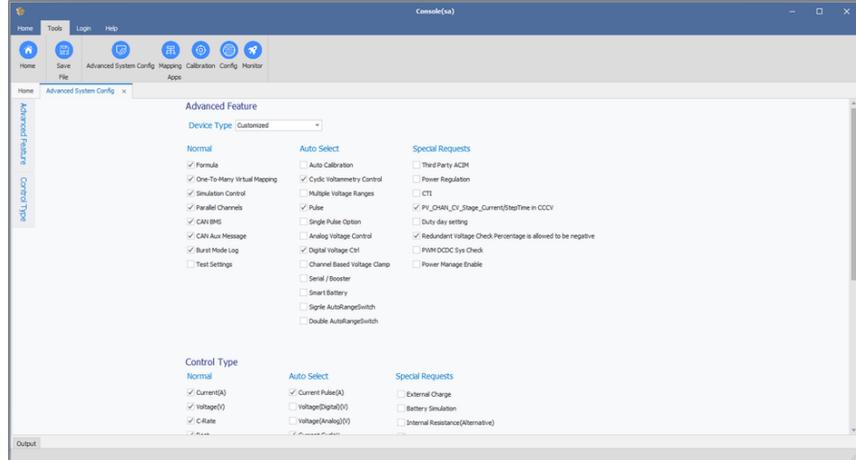


Figure 3-10 Advanced System Config Interface

The **Database Config (Configuration) Interface** is used for setting required functions by device series.

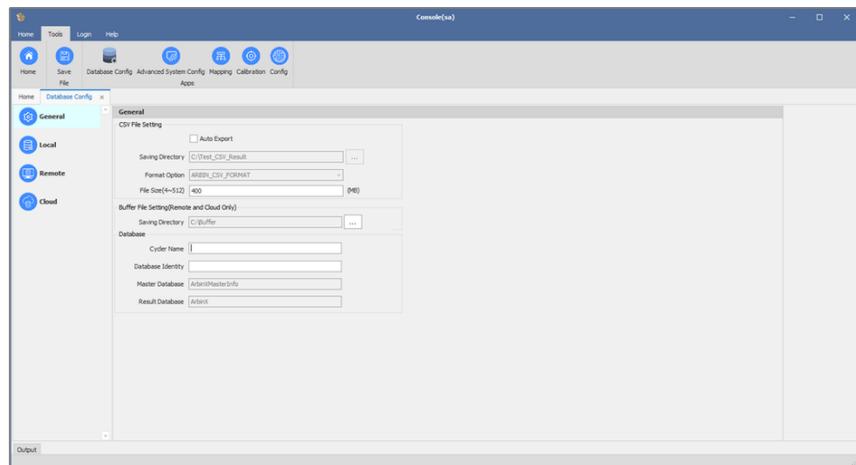


Figure 3-11 The Database Config (Configuration) Interface

The **File Management Interface** is used to backup and restore files.

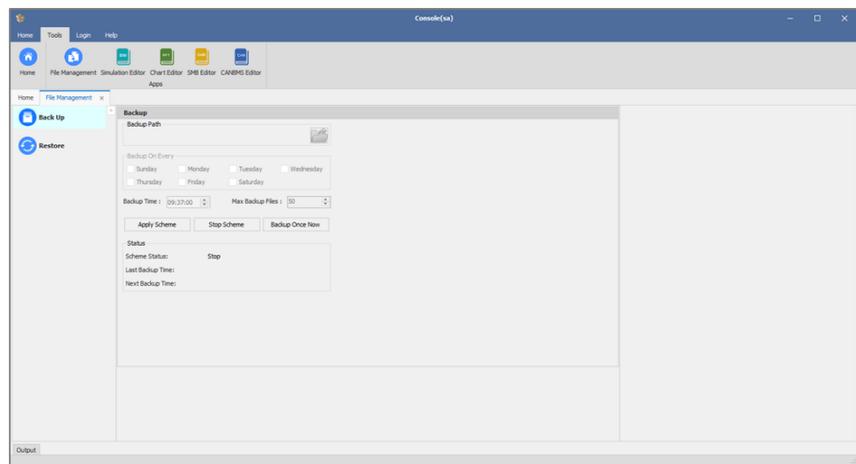


Figure 0-3 File Management interface

The **Schedule Editor** is used for process control. The Schedule File (file extension .sdx) provides information for running tests on batteries or other energy storage devices.

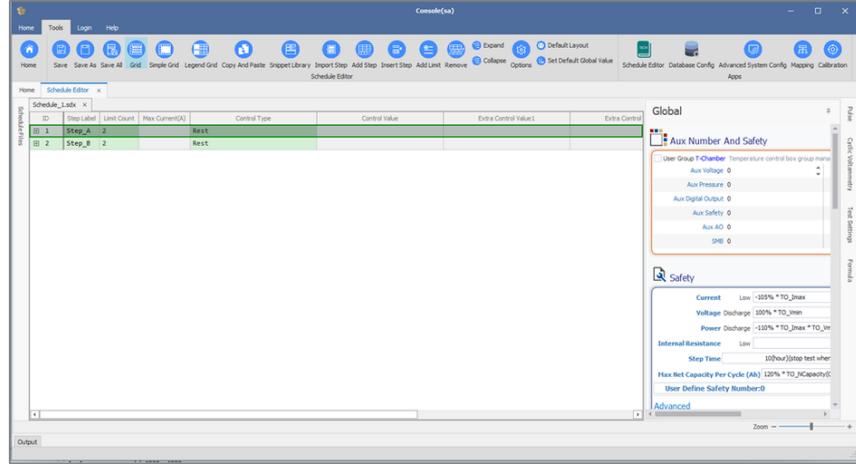


Figure 3-13 The Schedule Editor

The **Test Object Editor** is used for test object information. The Test Object File (file extension .to) is used to set charge and discharge limits and to identify the test object.

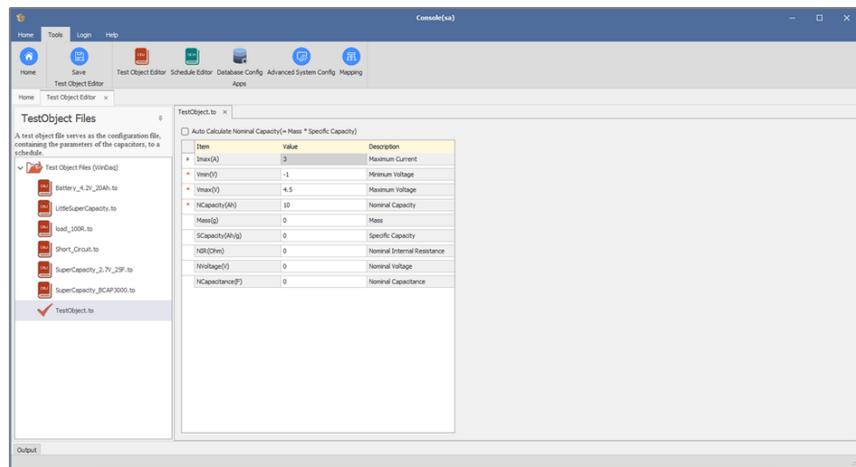


Figure 3-14 The Test Object Editor

The **CAN BMS Editor** is used to edit CAN BMS files, including input CAN signal configuration, output CAN message broadcast, and CAN message formula view.

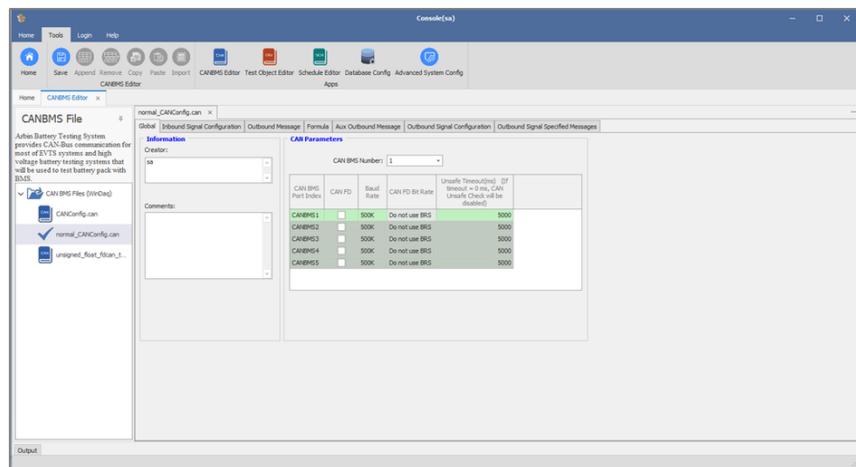


Figure 3-15 The CAN BMS Editor

The **SMB Editor** is used to edit SMB files (file extension .smb), which provide smart battery signal configuration.

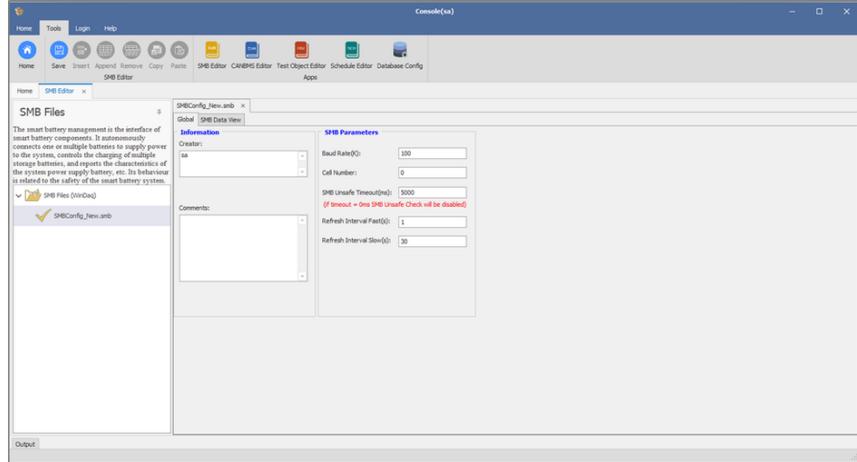


Figure 3-16 The SMB Editor

The **Chart Editor** is used to edit charts in DataWatcher. A Chart File (file extension .cht) provides the settings for DataWatcher.exe.

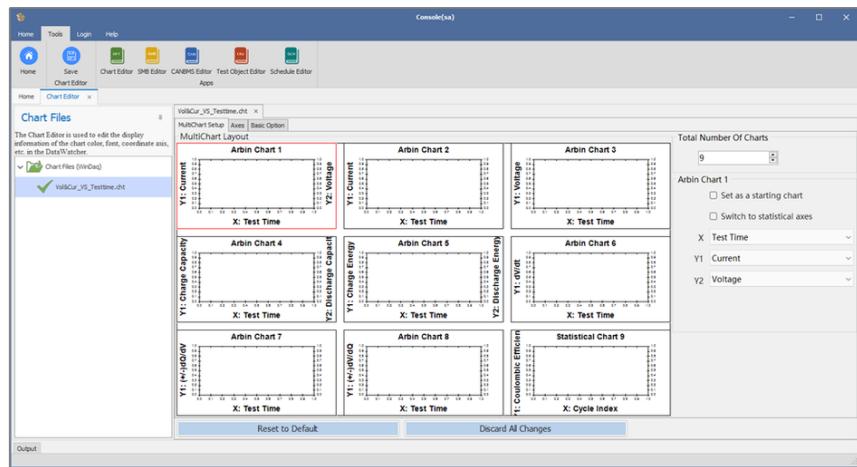


Figure 3-17 The Chart Editor

The **Simulation Editor** is used to configure the Simulation file. BMS files (file extension .can) are provided.

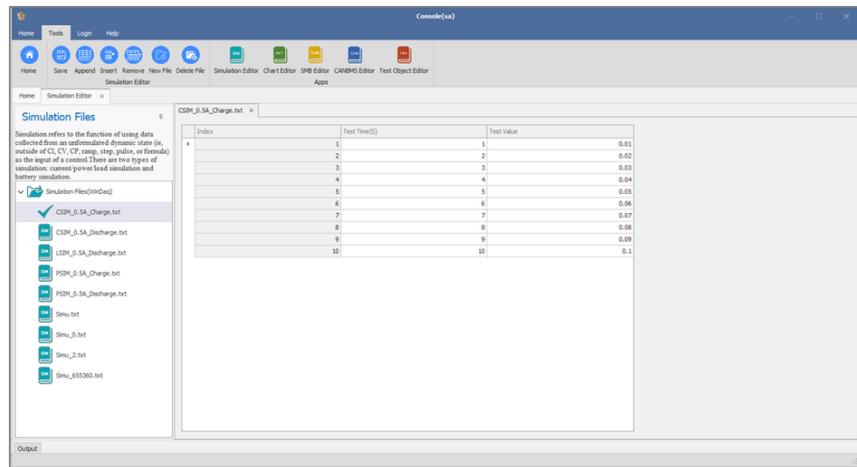


Figure 3-18 The Simulation Editor

DataWatcher is used to view and export data.

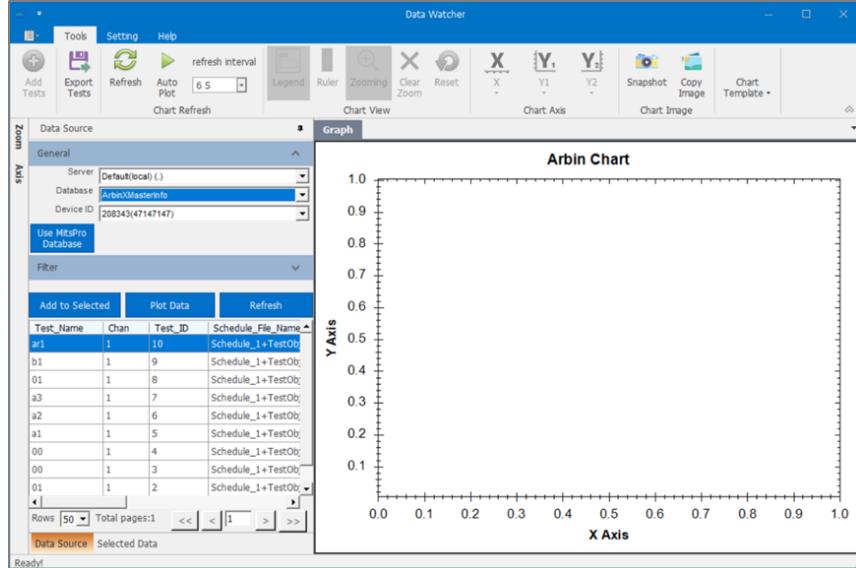


Figure 3-19 The DataWatcher Interface

The **Schedule Migration Interface** is used to manage file migration.

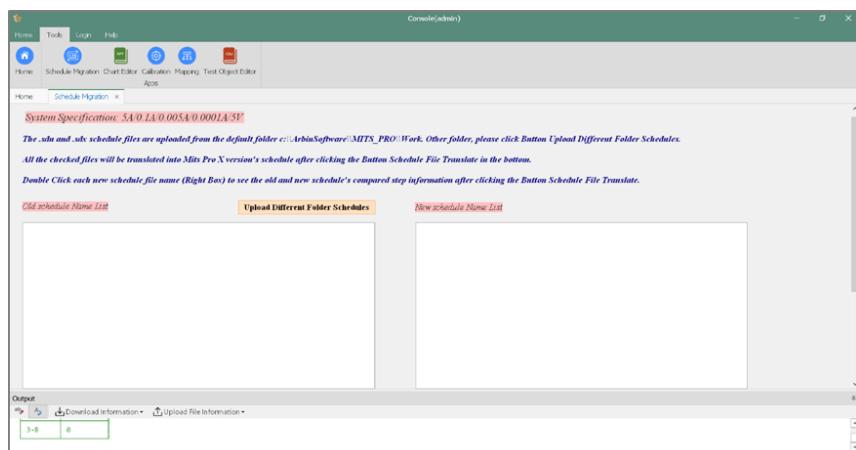


Figure 3-20 The Schedule Migration Interface

4: User Accounts and Permissions

4.1 Introduction to User Accounts and Permissions

4.1.1 Mits X Permission Levels

The Mits X software allows for different user capabilities and restrictions at different permission levels. There are four distinct permission levels in Mits X.

1. **Guest:** The "Guest" account has "ready-only" permissions for any Mits X files. Guest-level accounts have no editing or test operation permissions.
2. **Operator:** By default, accounts at the "Operator" level are able only to run and edit Tests.
3. **Administrator:** An "Administrator" account can manage devices and edit schedule files, Mapping Files, and other Mits X files.
4. **Manufacturer:** The "Manufacturer" account has the highest level of user permissions. This account level is reserved for Arbin and used internally to configure machine hardware and system-level information.

Multiple accounts can be assigned to the Operator and Administrator permission levels, based on distinct usernames and passwords. Additional details on user accounts and permission levels are provided in the following sections of this chapter.

4.1.2 Permission Level Details

The capabilities and restrictions at each permission level are defined by the following operation modules:

1. **Editing System Config File:** Modify the ArbinSys.cfg file.
2. **Editing the Mapping File:** Modify the ArbinSys.bth file.
3. **Channel Assign Schedule:** Assign a Schedule File to the channel.
4. **Conducting Tests:** Conduct the test in the Monitor Interface, including the ability to start, jump to, stop, and resume a test.
5. **Setup SQL Settings:** Modify the settings in ArbinSys.DBCF file.
6. **PWM Config:** This function is currently under development.

Operation Capabilities by Permission Level

1. **Manufacturer:** All above operations; settings cannot be modified.
2. **Administrator:** The following operations, all of which are optional and can be modified:
 - a. Editing the Mapping File
 - b. Channel Assign Schedule
 - c. Conducting Tests
 - d. Conducting Calibration
 - e. Setup SQL Settings
 - f. PWM Config
3. **Operator:** The following operations, all of which are optional and can be modified:
 - a. Editing the Mapping File
 - b. Channel Assign Schedule
 - c. Conducting Tests
 - d. Conducting Calibration
4. **Guests:** The Guest account is view-only and does not have access to any of the above operations.

User Type	Editing System Config File	Editing Mapping Files	Channel Assign Schedule	Conducting Calibration	Conducting Tests	Setup SQL Settings	PWM Config
Manufacturer	<input checked="" type="checkbox"/>						
Operator	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Administrator	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Guest	<input type="checkbox"/>						

Figure 4-1 Functions and Capabilities by Permission Level

4.2 Manage User Accounts and Permissions

4.2.1 The Permission Management Interface

Open the Permission Management Interface

1. In Mits X, click the "Login" option on the main menu.
2. Click the "Permission Management" icon to open the Permission Management Interface.

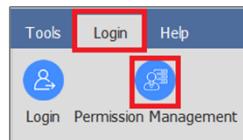


Figure 4-2 Login and Permission Management Icon

Functions of the Permission Management Interface

The Permission Management interface has two functions:

1. Operation Permission – Located on the left of the Permission Management Interface, allows user to edit the operation permissions for each permission level.
2. User Management – Located on the right of the Permission Management Interface, allows user to manage, edit, add, and delete users.

■ Lower-level accounts cannot edit higher-level operation permissions. For example, Administrator-level users cannot modify User Type, which is a Manufacturer-level operation.

4.2.2 Add a User Account

1. Under Operation Permissions, right-click on any user record to open the menu bar for managing user accounts.
2. Select "Add User" from the menu that appears to open the Add User Interface.
3. Enter the username and password.
4. Select the user type and channel permissions.
5. Enter the account description and complete other fields (optional).
6. Click the "OK" button to save the new user account.

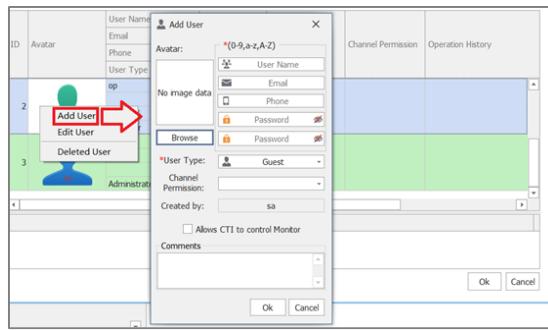


Figure 4-3 Add User Interface

4.2.3 Edit a User Account

1. Right-click on user record you want to edit to open the menu bar.
2. Select "Edit User" from the menu that appears.
3. Make any needed changes to the user account information, including password, user type, channel permission, and account description.
4. Click the "OK" button to save changes to the user account.

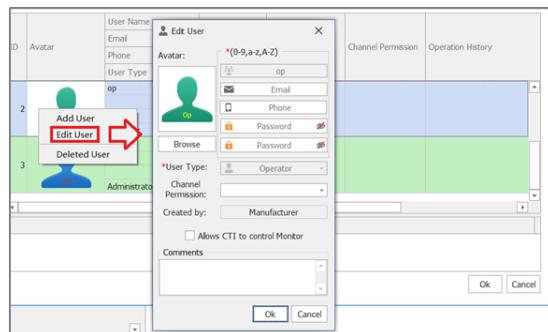


Figure 4-4 Edit User Interface

■ The scope of modification varies for different account levels. For example, Administrator-level accounts cannot modify the user type to Manufacturer.

4.2.4 Delete a User Account

1. Right-click on user record you want to delete to open the menu bar.
2. Select "Delete User" from the menu that appears.
3. Click the "OK" button to delete the user account.

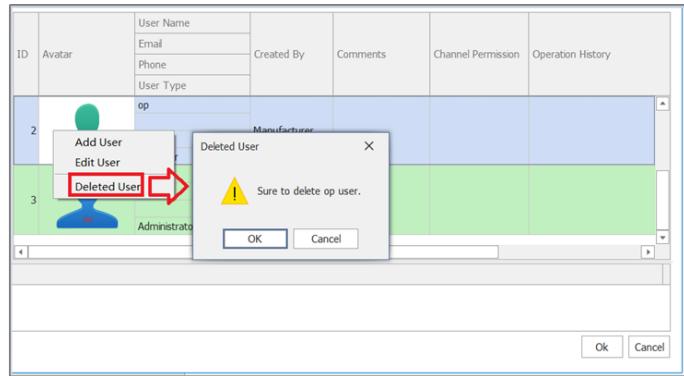


Figure 4-5 Delete User

The accounts with usernames "admin," "op," and "guest cannot be deleted. Also, Administrator-level accounts cannot be deleted by Manufacturer-level accounts.