



BreakerView™ Software User Manual

01.4UM.48072A

Applicable to Software Version 3.6

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Using This Manual

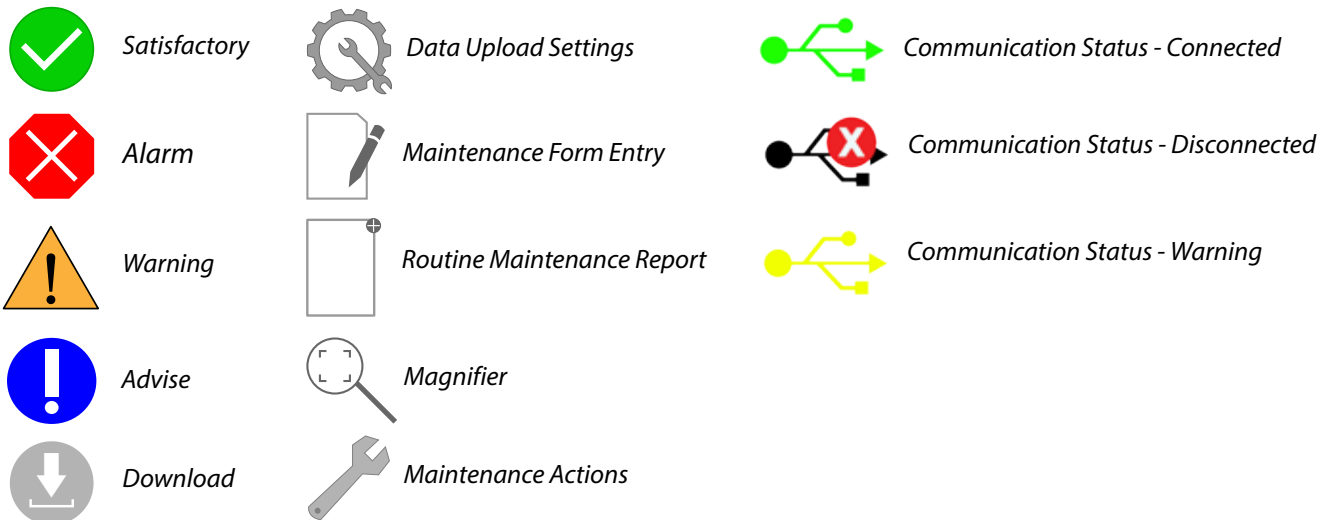
This User Manual provides information on how to use the BreakerView™ Software safely and efficiently. The User Manual contains important safety rules and familiarizes the user with the function and operation of the software.

Reading the User Manual does not release the operator from the duty of complying with all national and international safety regulations relevant to working with medium voltage circuit breakers.

Operator Qualifications and Safety Standards

Working on high-voltage assets can be extremely dangerous. This system is designed to be used without any access to energized components. Circuit breaker operations should be completed when personnel is at a safe distance from the switchgear. Any time spent in the vicinity of energized switchgear should be minimized. If the Circuit Breaker Monitors are networked via the infrared internal module, then any data collection by the BreakerView Software can be performed at a remote location.

Symbols Used



Safety Rules

Obey the following warnings to avoid injury or damage to the equipment:

- Any high-voltage working area rules.
- Do not make contact with parts under high-voltage or may move by spring forces or have stored energy present.
- Maintain a safe distance from parts that may change position suddenly during operations.

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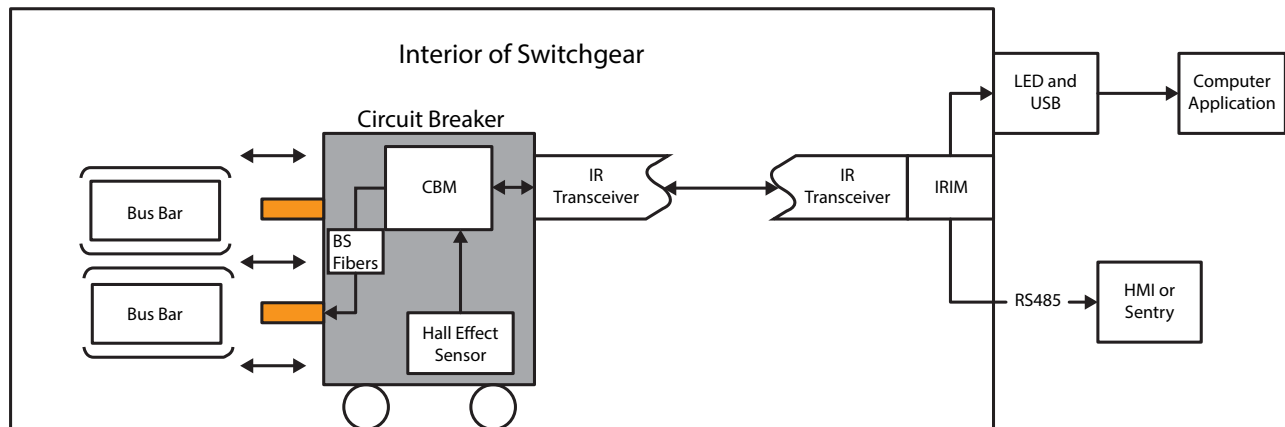
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Ch 1 System Overview

The Circuit Breaker Monitoring system includes the embedded Circuit Breaker Monitor (CBM), Infrared Interface Module (IRIM), External Indication Module (EIM), and the BreakerView™ Software which provides dashboards and performance values of monitored circuit breakers. The software resides on a computer system for the collection, analysis, and display of data. The computer will be connected either via a Modbus network to the IRIM or through a USB cable to the EIM installed on exterior of the switchgear section housing the circuit breaker with an integral CBM (*Figure 1*).

Figure 1 Overview of the Circuit Breaker Monitoring System



For details on the modules function, placement, and wiring refer to the latest version of the Circuit Breaker Monitor Instruction Bulletin.

BreakerView software provides a series of screens with dashboards and parameter values that permit rapid determination of the overall health of a circuit breaker. This is an asset management tool in direct support of condition based maintenance as a more targeted data driven version of predictive maintenance. Any operational performance issues are identified and diagnostics with corrective actions provided. Recording of events is performed by the CBM and in the embedded database within BreakerView software. Corrective maintenance as well as any routine maintenance records can be created and stored within the embedded database. This allows for a more complete performance record of the circuit breaker and efforts required to maintain the breaker is provided by BreakerView.

A. ABBREVIATIONS AND TERMS

1) Abbreviations

CBM - Circuit Breaker Monitor

EIM - External Indication Module

IRIM - Infrared (IR) Interface Module

UI - User Interface, BreakerView™ Software

2) Terms

Alert - advise, warning, or alarm on an EIM or in the BreakerView software.

Armature - plunger or plate that moves under magnetic force to perform mechanical action such as moving a latch.

Armature time - the time from application of voltage to a solenoid until the armature/plunger has completed its motion. This motion must occur in order to release a "latch" of the mechanism. See "current valley" labeled "2" on [Figure 2](#).

Baseline - a benchmark that became a standard for comparison and an indicator of past success.

Coil - winding of magnetic wire on a bobbin so electric current in the winding will generate a magnetic field to act on an armature/plunger when voltage is applied across it.

EIM - External Indication Module w/USB mini connection, see CBM Instruction Bulletin for further details.

Environmental Alerts - alerts that are generated by the ambient conditions to which the breaker is exposed.

Infrared (IR) - Infrared is having a wavelength just greater than that of the red end of the visible light spectrum but less than that of microwaves.

IRIM - Infrared Interface Module inside the circuit breaker compartment for infrared communication with CBM.

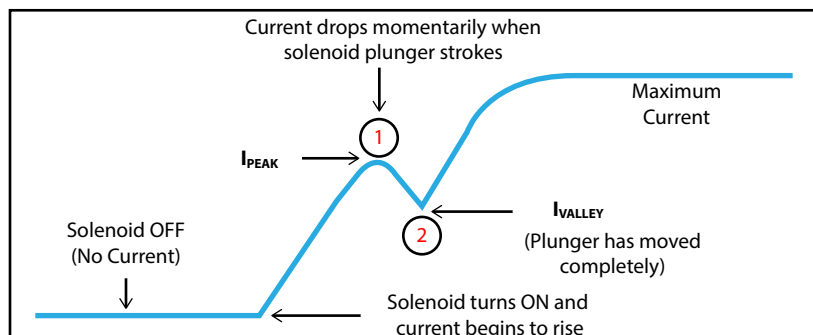
Mechanism time - the time from when a "latch" is released (trip prop or close latch) until the mechanism has changed state (open to close or close to open). This does not include the armature time.

Operation Type - Close, Charge, or Trip are the circuit breaker operation types of spring operated mechanisms.

Parameters - circuit breaker device key performance indicators such as device voltages, currents, contact positions and times.

Saturation - the point at which the current through the coil has reached maximum, the rate of change in current vs time has reached zero.

Total time - time from application of voltage across a device until the mechanical system has completed its action, i.e. time from voltage on trip coil until trip coil switches off from removal of voltage by completed switching of breaker mechanism linkage to auxiliary contact(s). Total Trip time corresponds to IEEE C37.100-1992 contact opening time.

Figure 2 Generic Solenoid Current Plot**B. SYSTEM REQUIREMENTS**

- PC with Intel Pentium 4 (equal or greater than 2.5 GHz), Pentium M (equal or greater than 1.5 GHz) Core, Core 2 processor or better; or AMD Athlon 64 or Turion 64 processor
- 1 GB RAM required, 2 GB or more recommended
- USB 2.0 compatible
- Microsoft Windows 7 or above; any SP level (32 bit and 64 bit)
- .Net Framework 4.6.2 or higher

C. SOFTWARE INSTALLATION

Download the BreakerView™ installers from the website listed here:
breakerview.powellind.com

The BreakerView Software has two types of installer.

1. BreakerView Full Installer (Database Bundle)
2. BreakerView Installer (Update Installer)

The BreakerView Full Installer includes the database instance used for storing the data collected from the CBM. For BreakerView to work, this should be installed first before applying any update to the software.

The BreakerView™ Full Installer, if installed on a Dell Edge Gateway device, includes an additional package that enables the use of the Cloud LED in Dell Edge Gateway devices during Automatic Data export. Refer to [Ch 6, Database Backup and Restore](#) for more details on the Cloud LED usage.

The BreakerView Installer (Update Installer) is used to update the software with additional or improved features. This is completed without re-installing the database instance from the full installer.

Prior to use of the software a CBM must be installed and wired into a circuit breaker and if it is desired to have the modules networked, an associated switchgear section must have IRIM and EIM modules installed and wired appropriately. Refer to the latest version of Instruction Bulletin 01.4IB.48070 for the installation of a CBM and IRIM with EIM. Additional configuration details for the CBM and IRIM are covered by work instructions beyond the details of the Circuit Breaker Monitor Instruction Bulletin or this manual.

Each of these software packages is launched by a Setup Wizard. An example screen is shown in [Figure 3](#). Each launch has the same behavior and desktop icon, only the software name is different.

1) *BreakerView Installation Procedure*

- a. Open the installation wizard.
- b. Click "Install" to proceed with the installation ([Figure 3](#)). This will install the database instance.

Figure 3 **BreakerView™ Installer Setup Wizard**

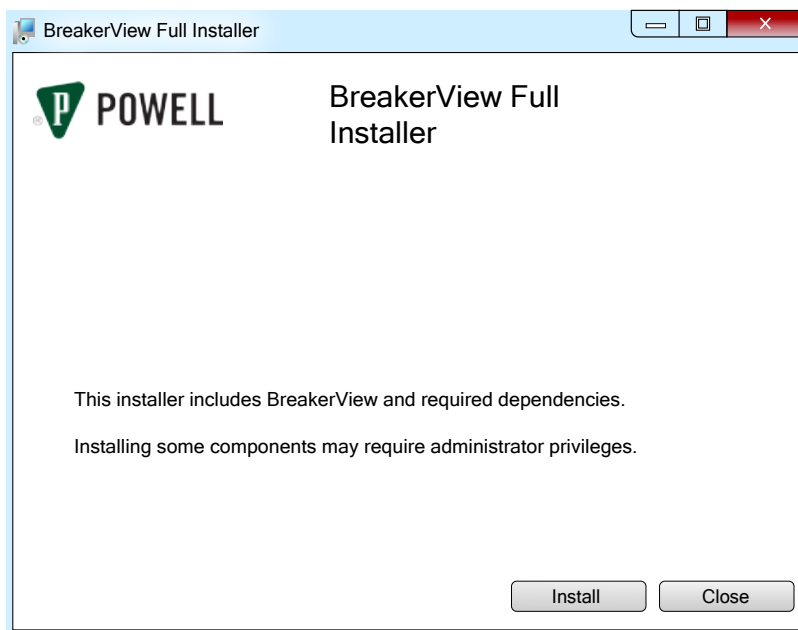
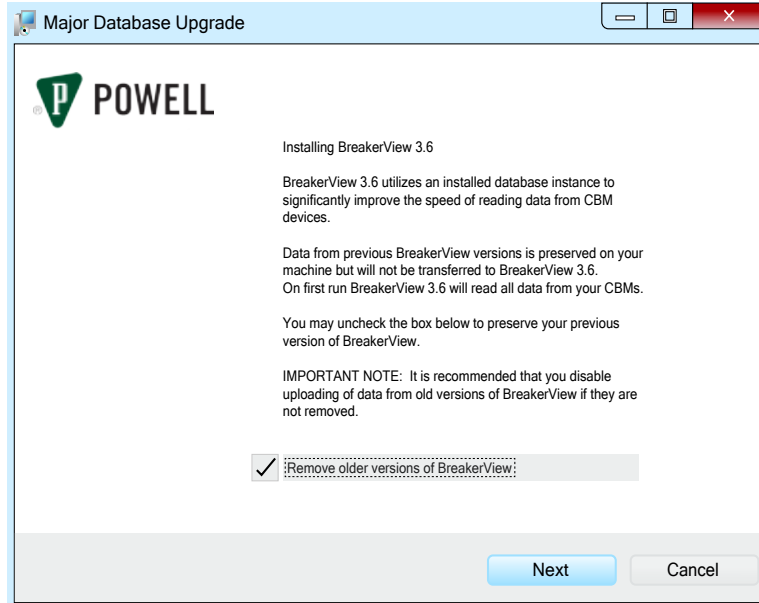
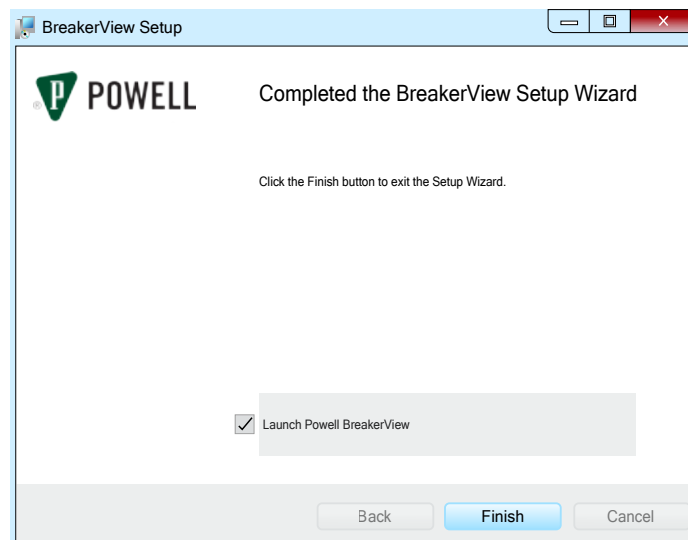


Figure 4 BreakerView™ Installer Major Database Upgrade Window

- c. After the database is installed, a "Major Database Update" window is displayed should a prior version of BreakerView™ be detected (Figure 4). The latest version of BreakerView utilizes a database instance to significantly improve the speed of reading from the CBM. It will ask to remove the older versions of BreakerView. If the check box is checked, it will remove the older version of BreakerView. Click "Next" to proceed.
- d. A license agreement window is displayed. Carefully read the End User Agreement and if accepted, put a check on the check box to acknowledge it. The agreement must be accepted in order to install the software.
- e. After the installation is completed, BreakerView can be launched immediately by checking the check box and clicking "Finish" (Figure 5).

Figure 5 BreakerView™ Installer Setup Complete

Ch 2 Software Overview

BreakerView™ software is an application designed to run within a PC environment to provide information on circuit breaker performance from data collected by the Circuit Breaker Monitoring system. The software can be run in an “online” or “offline” mode. Additionally, there is a web version of BreakerView available at the website breakerview.powellind.com providing the same functionality. The web version requires data from CBMs to be uploaded into the Cloud Database. The Cloud data service permits generation of dashboards with trending data for retrieval of any end users circuit breaker performance.

- Online BreakerView mode requires a connected CBM be communicating to the PC either via a Modbus network or USB connection, see the latest version of Instruction Bulletin 01.4IB.48070 for details on this system. This mode permits viewing of any recent event.
- Offline BreakerView mode can be used when the computer running BreakerView is disconnected and allows use of previously recorded data within the embedded data base. In this mode the Overview screen will not display breaker health but all collected data will be available.

A. STARTING THE SOFTWARE

The BreakerView desktop icon ([Figure 6](#)) permits launching the software.

Figure 6 BreakerView™ Desktop Icon



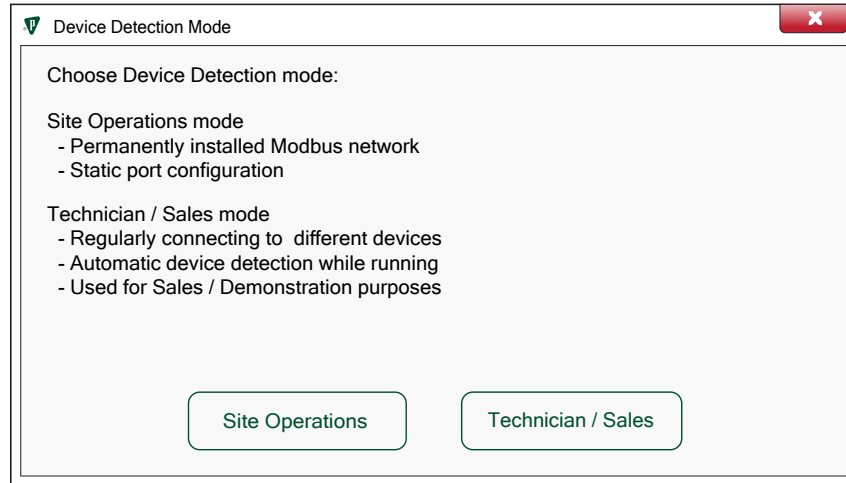
If the desktop icon does not appear after installation, create a shortcut by finding the application in the folder labeled “Powell Industries” on the user's C: drive.

C:\Users\USERNAME\AppData\Local\Powell Industries

The BreakerView application will be setup when first launched.

1. Choose a device detection mode ([Figure 7](#)).
 - a. **Site Operation Mode:** This mode is used when the CBMs are configured to communicate via a Modbus network using either Modbus RTU, a serial level protocol, or Modbus TCP/IP that runs on Ethernet.
 - b. **Technician/Sales Mode:** This mode is used for automatic device detection via a USB connection to the associated EIM-IRIM-CBM configuration.

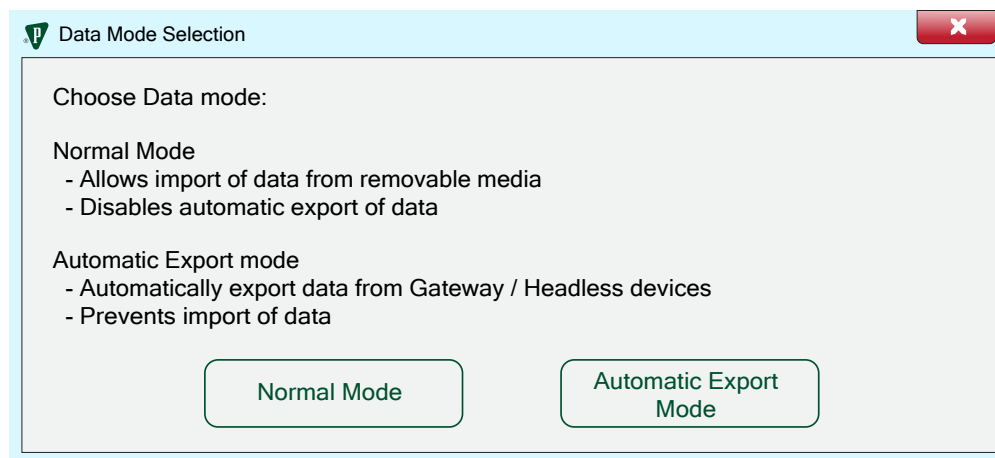
Refer to [Ch 3 Connecting BreakerView to the Circuit Breaker Monitor](#) for connection setup.

Figure 7 Device Detection Mode

2. Choose the data mode (Figure 8).

- a. **Normal Mode:** Allows for the import of data from a removable device and disables the automatic export of data.
- b. **Automatic Export Mode:** Enables automatic export of data when a USB mass storage device is inserted into the PC and disables the import of data. This mode is intended for use on unattended headless edge servers. Do not select it unless instructed by a Powell representative.

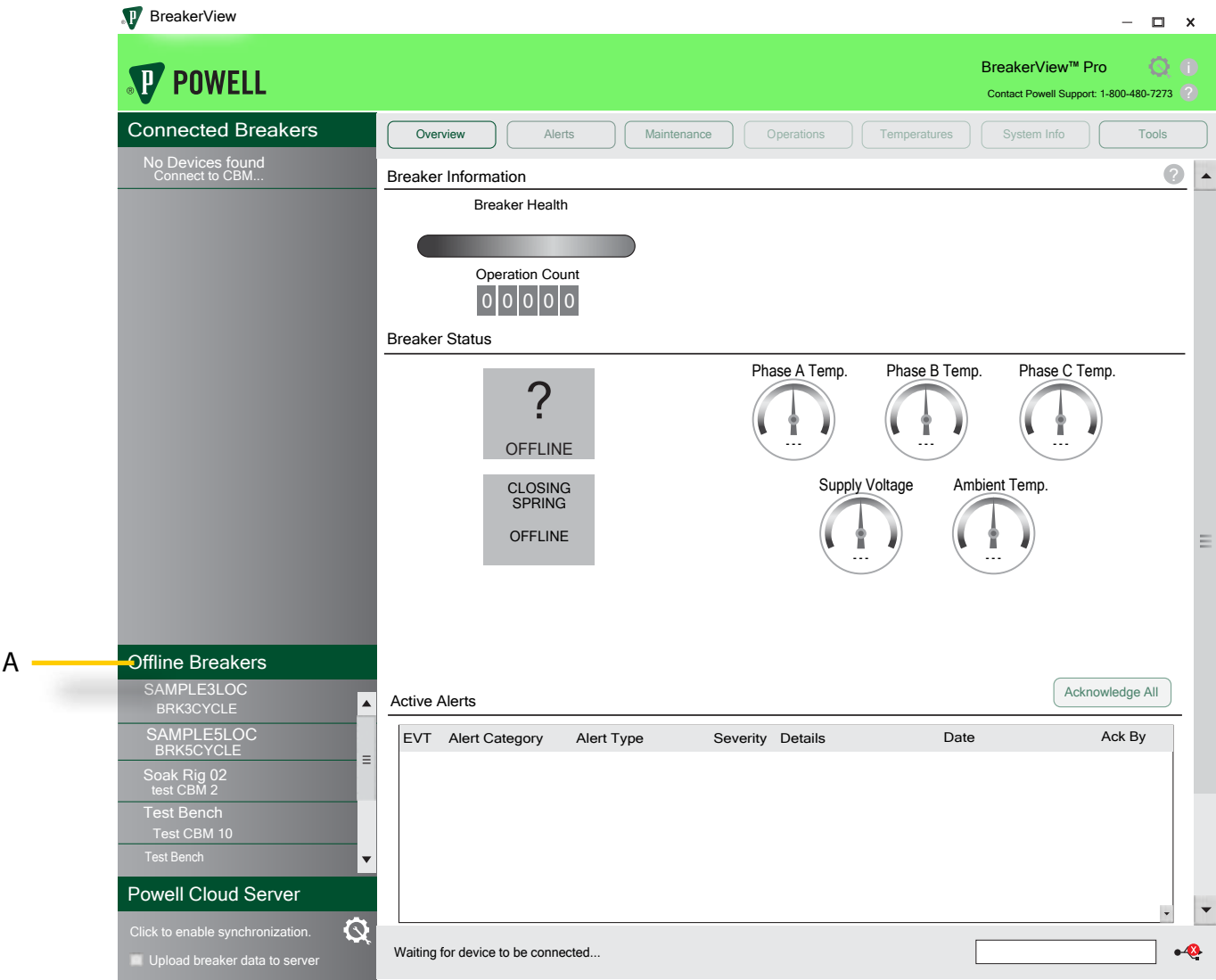
The Device Detection and Data Transfer mode settings are also available in the "Application Maintenance" menu (Figure 66).

Figure 8 Data Mode Selection

B. BREAKERVIEW™ OFFLINE USAGE

Starting the BreakerView™ software without any connected CBM units will show the screen in [Figure 9](#).

Figure 9 BreakerView™ in Offline Mode



A. Offline Circuit Breakers

Stored information from any previously connected CBMs can be displayed by selecting an offline circuit breaker from the list in the lower left pane ([Figure 9, A](#)).

1) Offline Screens

When working offline with the BreakerView™ Software all screens are available but will be populated with stored data only (Figure 10). The Overview screen (Figure 12) will display collected data. Grayed fields on the screen inform the user that there is no information on the current circuit breaker state.

Figure 10 Offline Breaker Selected to Review Previously Recorded Data

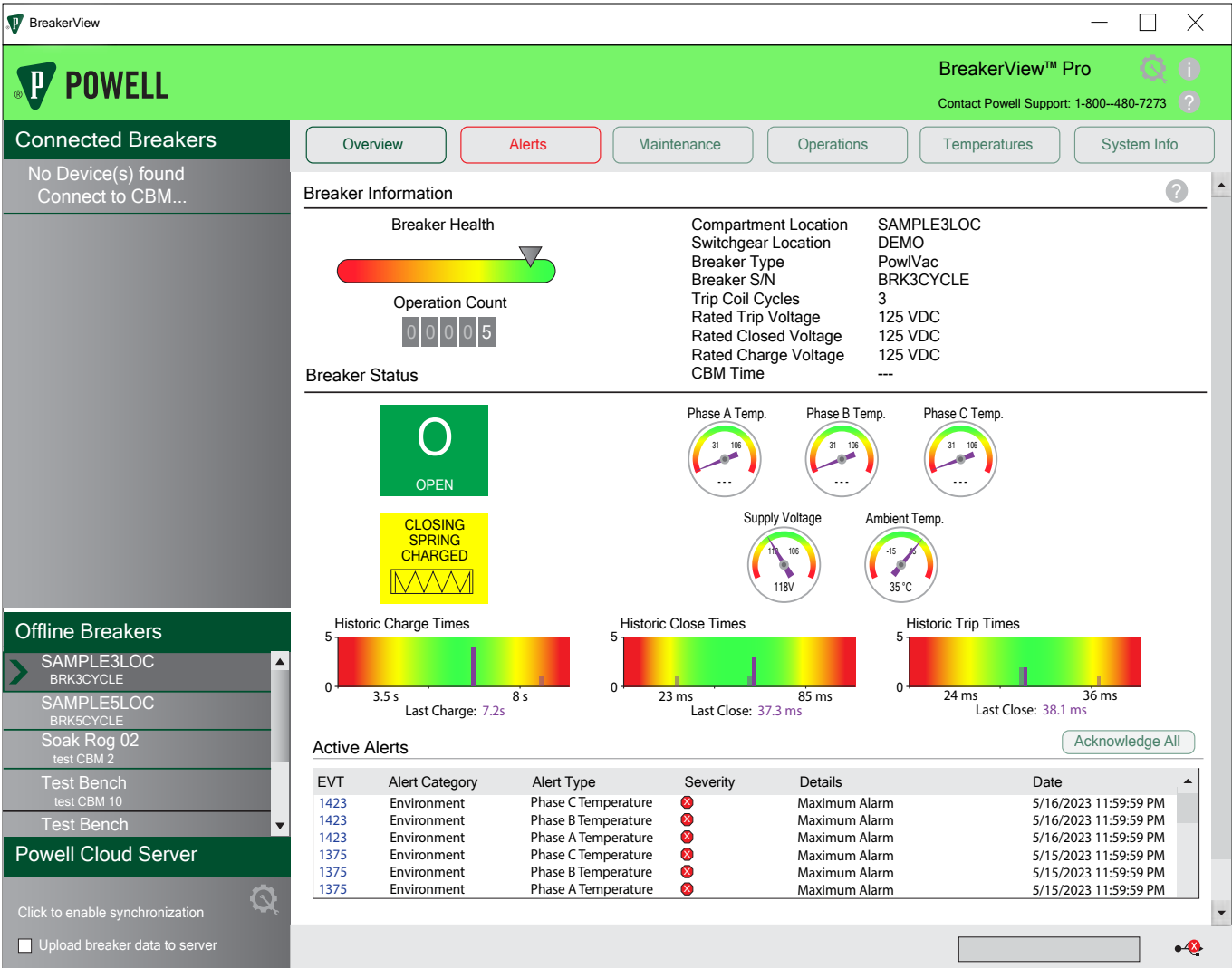
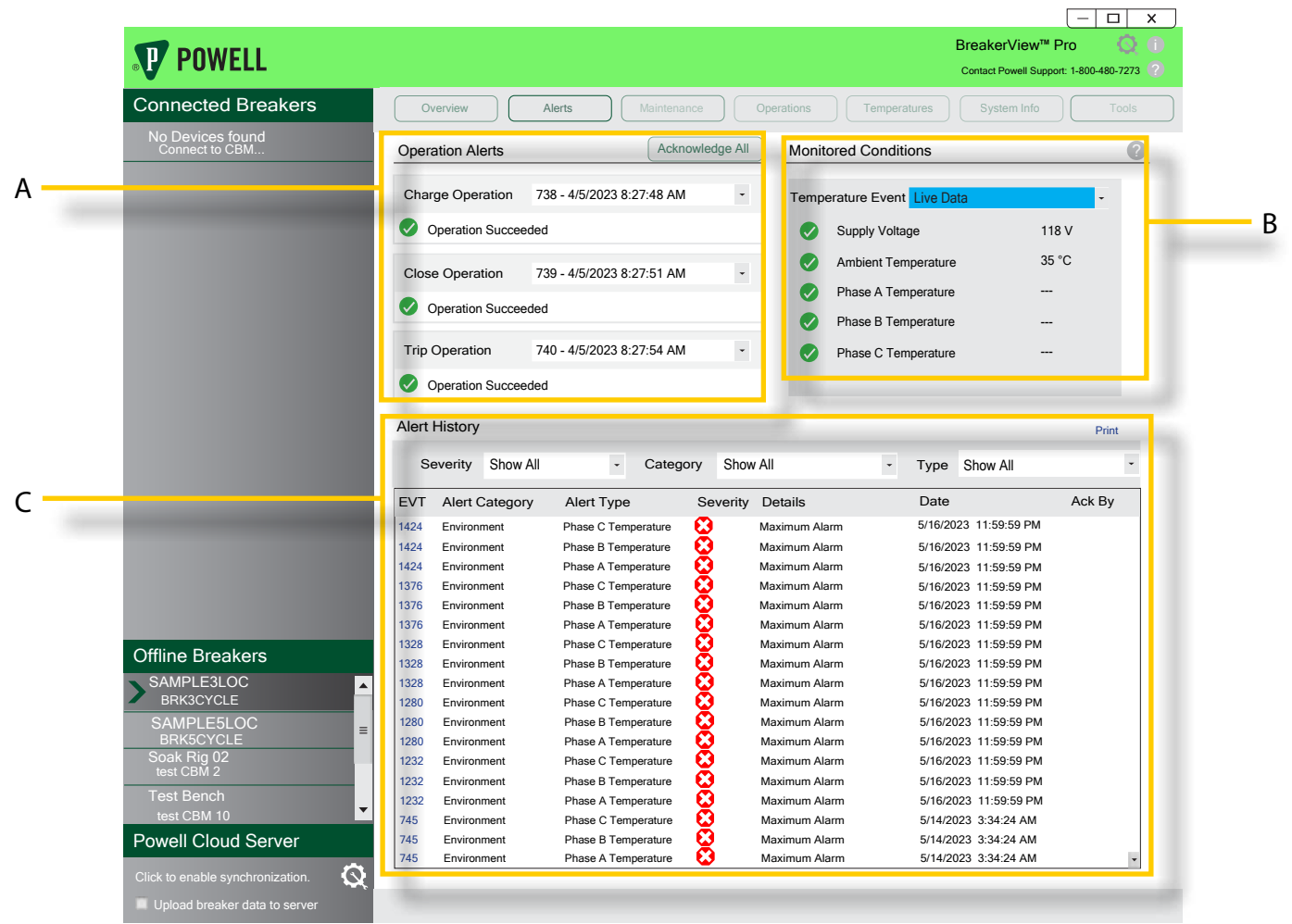


Figure 11 Offline Alert Screen



- A. Operation Alerts
- B. Monitored Conditions
- C. Alert History

 Satisfactory

 Advise

 Warning

 Alarm

The offline Alerts screen displays the collected data for any advisories, warnings, or alarms. The upper left section "Operation Alerts" (Figure 11, A) shows the status of the last three event types (charge, close, and trip). From Figure 11 it can be seen that each of these events were within the satisfactory bands for performance. The "Monitored Conditions" (Figure 11, B) in the upper right side of the screen displays the most recent temperature event conditions (environmental conditions) of supply voltage, ambient temperature, and phase temperatures. From the display in Figure 11, all ambient conditions were within satisfactory range.

The "Alert History" ([Figure 11, C](#)) in the lower portion of the screen displays a list of historical events collected from the selected CBM.

Note: *The offline Alert Screen shows an inactive "Acknowledge All" button since no communications are present.*

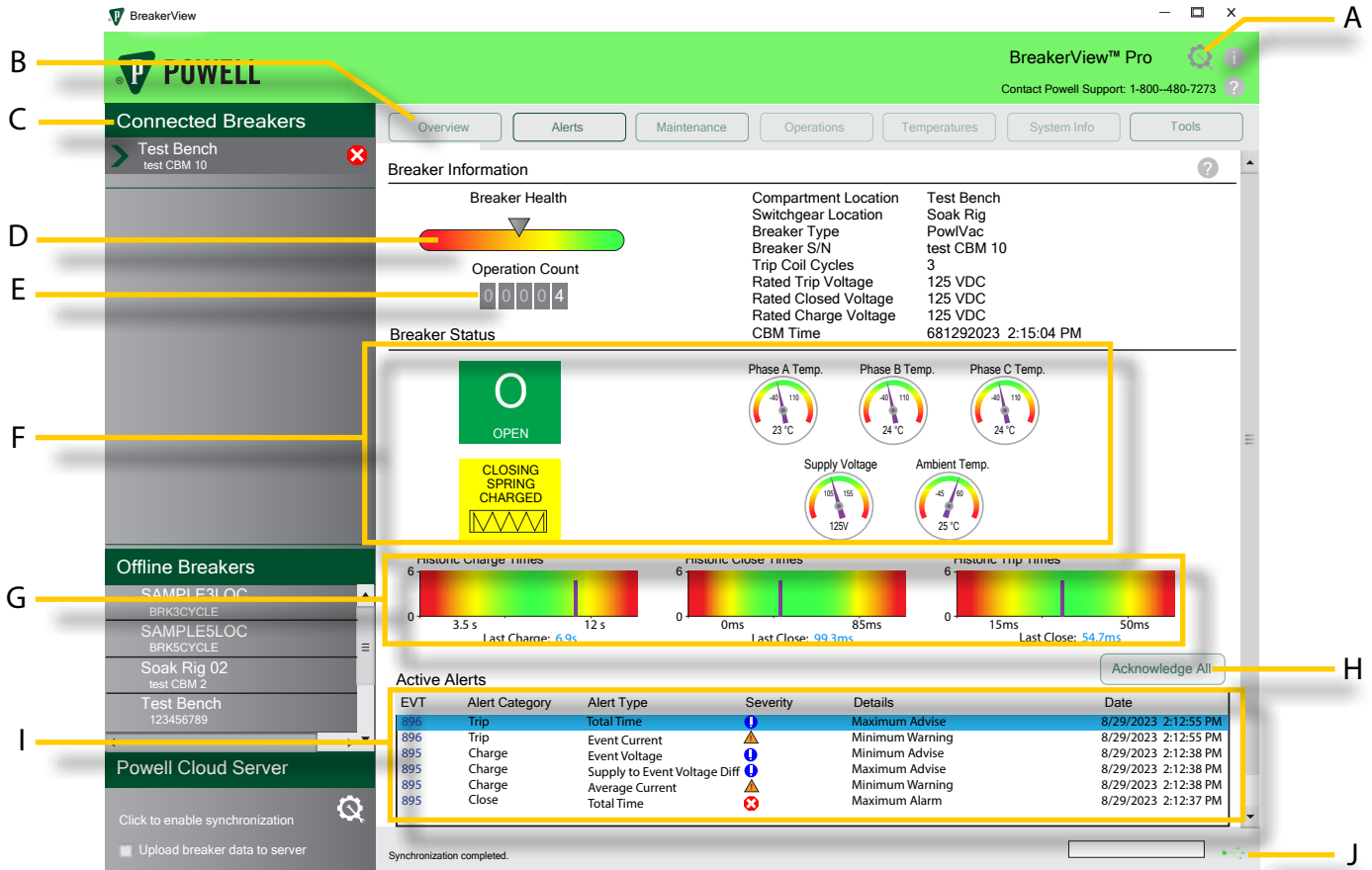
Functionality of the offline screens are the same as online with minor exceptions. Refer to [Ch 2 Software Overview, C. BreakerView Online Usage](#) for online screen functionality to understand offline screen usage.

C. BREAKERVIEW™ ONLINE USAGE

When a CBM is connected and viewed through the BreakerView™ software, the health status, position, and charging spring state along with last trip, close, and charge times are displayed and will update as new information is received from the CBM.

1) Overview Screen

Figure 12 View of Overview Screen



- A. "Setting" Icon
- B. "Overview" Button
- C. Connected Breakers
- D. Breaker Health
- E. Operations Counter
- F. Breaker Status
- G. Event Histograms
- H. "Acknowledge All" or "Acknowledge Selected" Button
- I. Active Alerts
- J. Communication Status

In the upper left hand portion of the screen under Connected Breakers (*Figure 12, C*), any networked IRIMs will communicate the breaker name to be displayed here. If the CBM is communicating the data from a selected breaker, that breaker's data will be displayed when the breaker is selected.

The Overview screen (*Figure 12*) shows a slider labeled "Breaker Health" (*Figure 12, D*) which is based on calculations using operation performance measures of the most recent close, charge, and trip events. If any one event falls into the warning or alarm bands, the breaker health will be fixed to the lowest value.

The circuit breaker operations counter value is displayed beneath the health slider (*Figure 12, E*). This value is captured by the CBM and only counts breaker operations during which time the CBM was energized. If a breaker operation occurred when the breaker had no control power the actual operation counter value will differ from the display and this displayed value can be updated by manually entering the mechanical counter value in the System Info screen.

Compartment Location, Switchgear Location, Breaker Type, Breaker Serial Number, and rated device voltages are also shown on this screen.

Breaker Status (*Figure 12, F*) mimics the flags on the circuit breaker for breaker position and closing spring condition. Additionally, the last trip time (opening time as defined by IEEE C37.010-1999 section 5.7), close time, charge time, and phase temperatures measured near the sliding contact of the vacuum interrupter are displayed.

The breaker timing is provided by one of the methods that are discussed in IEEE C37.09-2018 section 5.12 Timing Tests.

As a circuit breaker generates three events, close, spring charge, and trip (for spring operated mechanisms), the timing statistics of these events are displayed in histograms (*Figure 12, G*) within colored scale bands showing the events within one of the three bands. A normal event time will be accumulated within the green band, a warning within the yellow band and alarms will appear in the red bands. Note that the bold purple line is the most recent event timing value.

Active Alerts (*Figure 12, I*) shows the active events with alerts that have not been acknowledged yet by the user. Clicking the "Acknowledge All" button (*Figure 12, H*) will acknowledge all active alerts and these will no longer be visible on this screen.

When selecting a specific alert, the "Acknowledge All" button (*Figure 12, H*) will change to "Acknowledge Selected". With the alert selected, click on the "Acknowledge Selected" button to acknowledge the specific alert and that event will no longer appear on the screen.

Selecting multiple alerts by CTRL + click or SHIFT + click methods to select and highlight multiple alerts will also change the "Acknowledge All" button (*Figure 12, H*) to "Acknowledge Selected" button. Clicking the "Acknowledge Selected" button after this selection or highlighting method will acknowledge the selected alerts and those events will no longer be visible on this screen.

Communication status (Figure 12, J) indicates the health of the communication link between BreakerView™ software, the IRIM, and its connected CBM. There are several different icons used as illustrated below.

Communication to the CBM is verified by this icon:



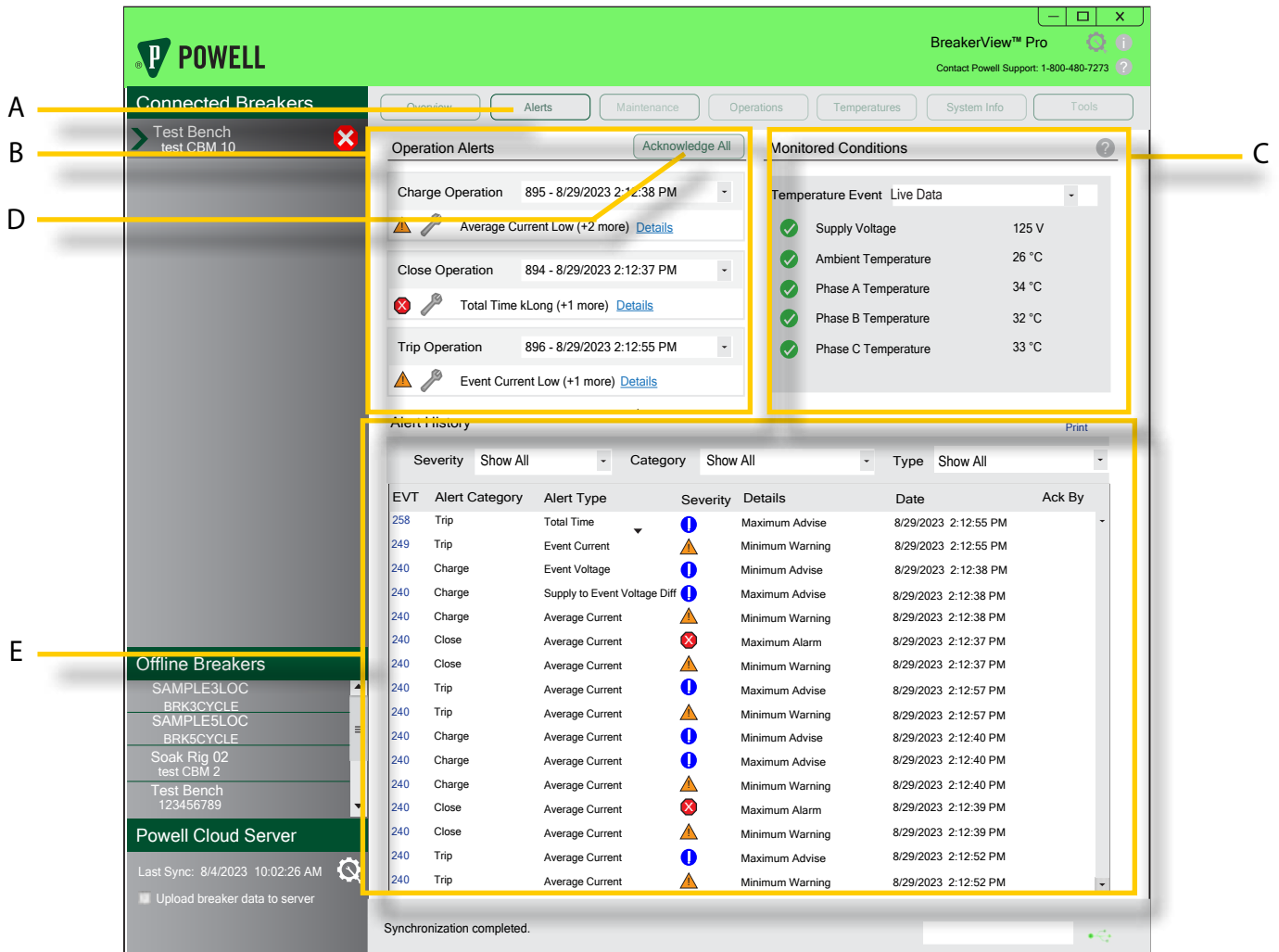
No communication to the CBM is shown by this icon:



Error or interruptions on communication to the CBM is shown by this icon:



2) Alert Screen

Figure 13 View of Alert Screen

- A. "Alerts" Button
- B. Operation Alerts
- C. Monitored Conditions
- D. "Acknowledge All" or "Acknowledge Selected" Button
- E. Alert History

Clicking on the "Alerts" button (Figure 13, A) will bring up the Alert Screen.

Each alert falls into one of two categories:

1. **Operation alerts;** trip, close, and charge
2. **Monitored conditions;** supply voltage, ambient temperature, and phase temperature.

The most recent events are listed under "Operation Alerts" on the upper left hand side ([Figure 13, B](#)) and "Monitored Conditions" on the upper right hand side ([Figure 13, C](#)). These two upper sections display the most recent events based on event ID. If any of these events were alerted, the display would reflect that as discussed below. The most recent alert will be displayed at the top within its group and at the top of the "Alert History" ([Figure 13, E](#)) with the event ID shown under the column EVT. Severity of the alert is designated by the symbols:



= Advise



= Warning



= Alarm

The alert symbol will flash until the alert has been acknowledged. Clicking "Acknowledge All" ([Figure 13, D](#)) will display an entry panel for the name of person acknowledging an alert. The name of the person who acknowledged the alerts will be indicated in column "Ack By" in the Alert History.

When selecting a specific alert, the "Acknowledge All" button will change to "Acknowledge Selected". With the alert selected, click on the "Acknowledge Selected" button to acknowledge the specific alert and that event will be marked as "acknowledged". The name of the person who acknowledged the alert will show in the "Ack By" column in the Alert History.

Selecting multiple alerts by CTRL + click or SHIFT + click methods to select and highlight multiple alerts will also change the "Acknowledge All" button to "Acknowledge Selected" button. Clicking the "Acknowledge Selected" button after this selection or highlighting method will acknowledge the selected alerts and those will be marked as acknowledged. The name of the person who acknowledges the alerts will be indicated in column Ack By in the Alert History.

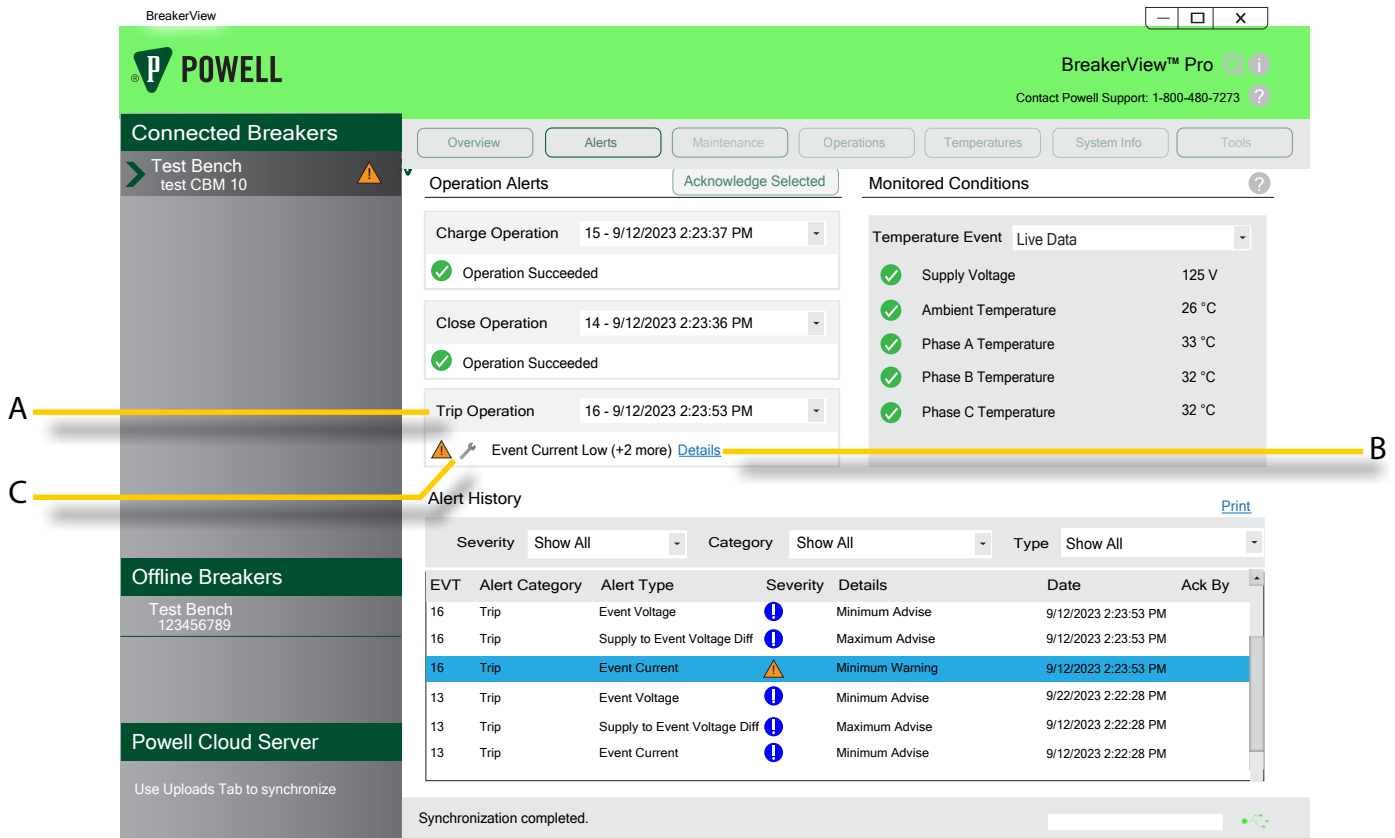
Operational Alerts Clearing: When a good operation type of previously alerted type has been performed and previous alerts are acknowledged, the status will change on the EIM and in BreakerView™ to green. If there is no new good operation and the alert is acknowledged, the symbol will cease to flash but the Alert button will stay red and the alert will continue to be displayed in the "Operation Alerts" section until the alert condition has been replaced with a good operation.

When a supply voltage, ambient temperature, or phase temperature type alert has triggered, the symbol in the Monitored Conditions will change to an advise/warning/alarm depending on the level of the alert. Warning and Alarm level alerts will change the EIM and the BreakerView status to warning (amber) or alarm (red) only after the alert level is sustained for the required amount of time indicated as "soak time" in the system information tab. If the alert meets the required "soak time", it will be registered in the Alert History. If the level for these types are still in alert level and the alert is acknowledged, the symbol will cease to flash but the Alert indication and the EIM status will remain in warning or alarm status. This alert will be cleared when the level of the alert returns to the acceptable levels and sustained for the required "soak time".

Note: "Advise" alerts are only indicated on the BreakerView software, no indication of these is given on the EIM or CBM.

The list of alerts that are currently available is found in [Table A, CBM Alerts and Source](#).

Figure 14 Alert Screen with Trip Warning



- A. Trip Operation
- B. "Details"
- C. "Wrench" Icon

In *Figure 14*, the trip operation (*Figure 14, A*) had a measured low event voltage during the trip operation. A wrench icon (*Figure 14, C*) adjacent to the warning symbol (yellow triangle), provides a link to recommended maintenance actions when clicked on by the user. Acceptable event voltage range and measured event voltage values are shown in a pop-up window (*Figure 15*) when "Details" (*Figure 14, B*) is clicked. Alerts can be viewed as described when online or offline. Online provides the most current alerts that can be reviewed.

Figure 15 Alert Details

Close Operation

219 9/5/2017 9:37:51 AM

✓ Operation Success

Trip Operation

✗ Total Time

Alert History

Alert Category

EVT	Alert Category
222	Environment
222	Environment
221	Environment
221	Environment
221	Environment
221	Environment
217	Trip
217	Trip
217	Environment
217	Environment
217	Environment
217	Environment
217	Environment
216	Close
216	Close
216	Close

✓ Ambient Temperature

35 °C

Details

Alert Details

Acknowledge All

Alert Type Trip

Alert Event ID 16 - 9/12/2023 2:23:53 PM

View Operation

Primary—Related Alerts	Category	Event Value	Acceptable Limits
ⓘ Event Voltage Low	Trip	67.0 V	70 - 155 V
ⓘ Supply to Event Voltage Diff High	Trip	60.0 A	No Min - 30 V
⚠ Event Current Low	Trip	1.08 A	1.40 - 3.50 A

Close

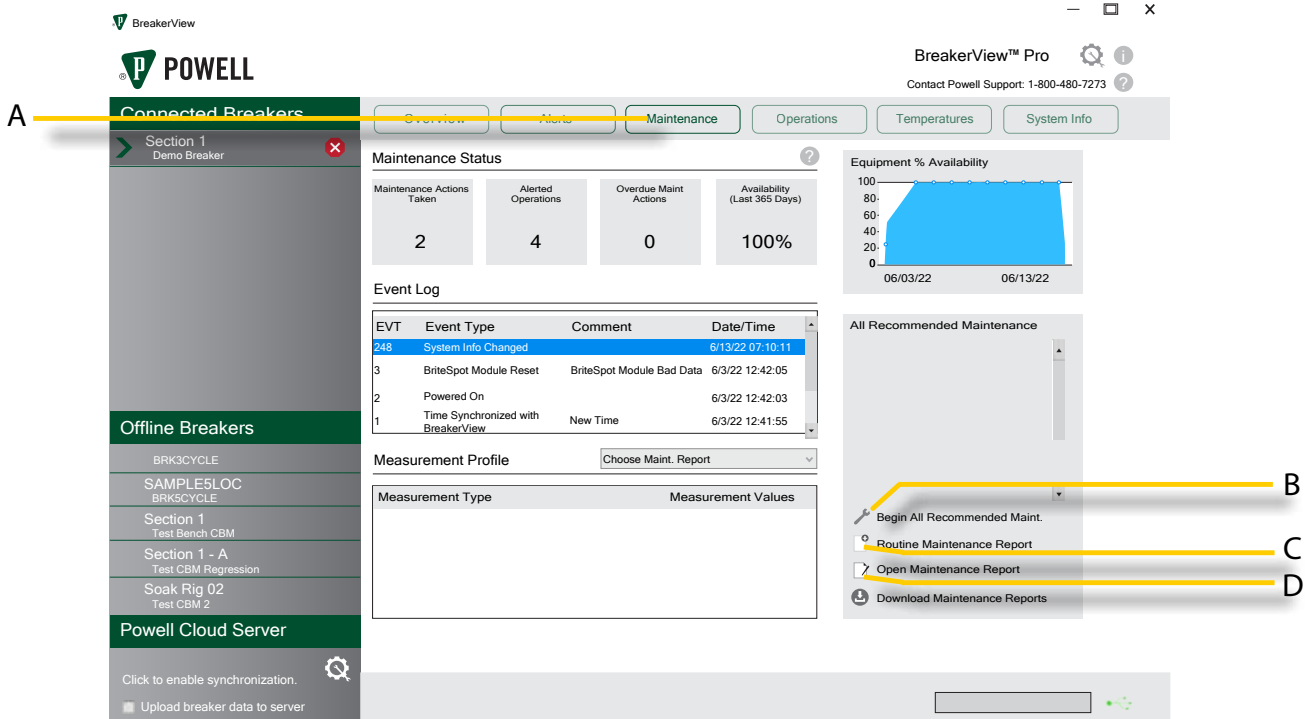
An example Alert Details (Figure 15) gives the event value (67V), acceptable range and related alerts. This example shows that the trip event voltage is too low compared to the acceptable range and the trip event current is low.

Alerts may originate from either the CBM's algorithms or those of the BreakerView™ software. The source of a given alert type is shown in [Table A, CBM Alerts and Source](#).

Table A CBM Alerts and Source

Alert	Level Available	Source
Charge Time - Long or Short	Advise & Warn	CBM
Event Avg Current, Charge - High or Low	Advise & Warn	CBM
Event Voltage, Charge - High or Low	Advise	UI
Event Voltage Sag/Swell, Charge - High	Advise	UI
Event Voltage Spike, Charge - High	Advise	UI
Close Total Time - Long or Short	Advise, Warn & Alarm	CBM
Event Current, Close - High or Low	Advise & Warn	CBM
Event Voltage, Close - High or Low	Advise	UI
Event Voltage Differential, Close to Aux - High	Advise	UI
Event Voltage Sag/Swell, Close - High	Advise	UI
Event Voltage Spike, Close - High	Advise	UI
Trip Total Time - Long or Short	Advise, Warn, or Alarm	CBM
Event Current, Trip - High or Low	Advise & Warn	CBM
Event Voltage, Trip - High or Low	Advise	UI
Event Voltage Differential, Trip to Aux - High	Advise	UI
Event Voltage Sag/Swell, Trip - High	Advise	UI
Event Voltage Spike, Trip - High	Advise	UI
Supply Voltage - High or Low	Advise & Warn	CBM
Phase A Temperature - High	Warn & Alarm	CBM
Phase B Temperature - High	Warn & Alarm	CBM
Phase C Temperature - High	Warn & Alarm	CBM
Ambient Temperature - High	Warn & Alarm	CBM


3) Maintenance Screen

Figure 16 View of Maintenance Screen

- A. "Maintenance" Button
 B. "Wrench" Icon
 C. Routine Maintenance Report
 D. "Form" Icon

The Maintenance Screen (Figure 16) provides dashboards of the status of maintenance actions, overall equipment availability based on a breaker's control system being energized over a rolling twelve month period, event log, recommended maintenance based on alerts, routine maintenance report creation, and any measurements recorded for the circuit breaker.

When an alert is received and has been determined to require corrective action, the following steps will be used:

Clicking on the wrench icon  adjacent to "Begin All Recommended Maintenance", (Figure 16, B) will bring up a dialogue box to enter the maintenance report name. This should follow the customer adopted standard but in the absence of this, Powell suggests a combination of the date, location, and technician name/initials is used. Following this, the Recommend Maintenance pane will be displayed (Figure 17). This shows a list of actions that are recommended in order to address the alerted condition.


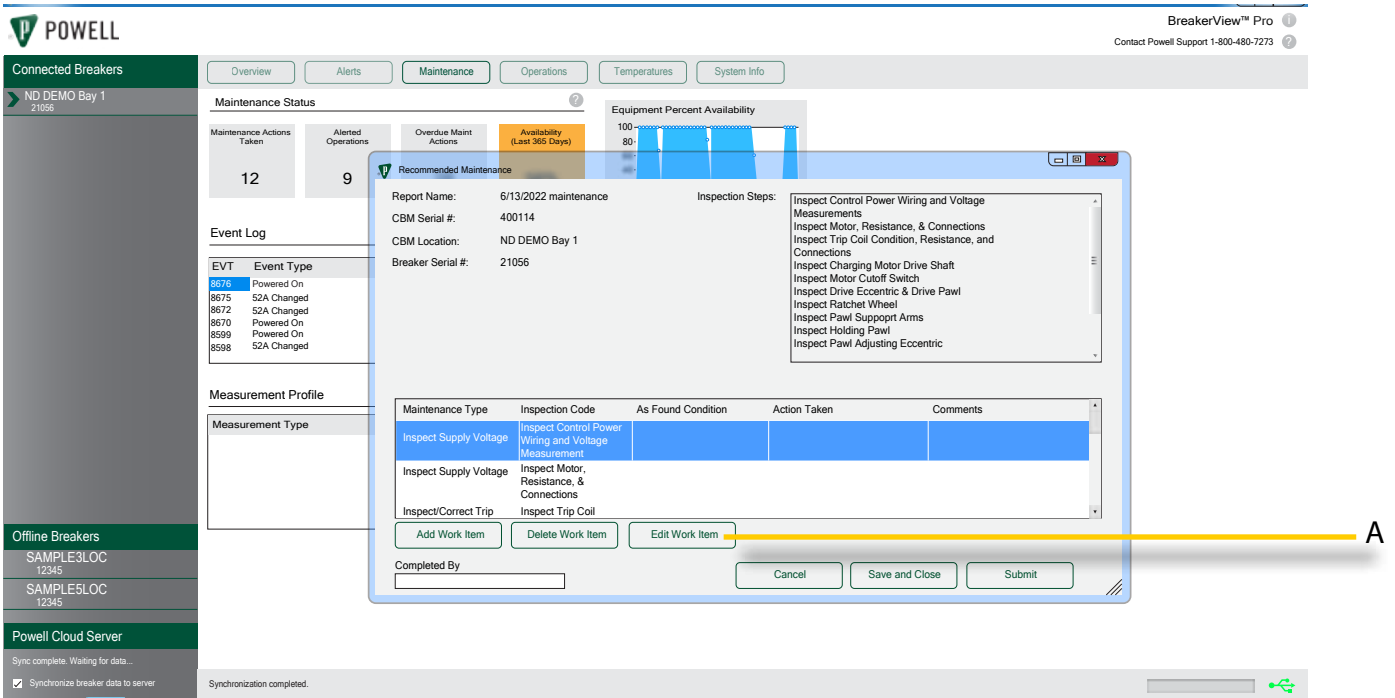
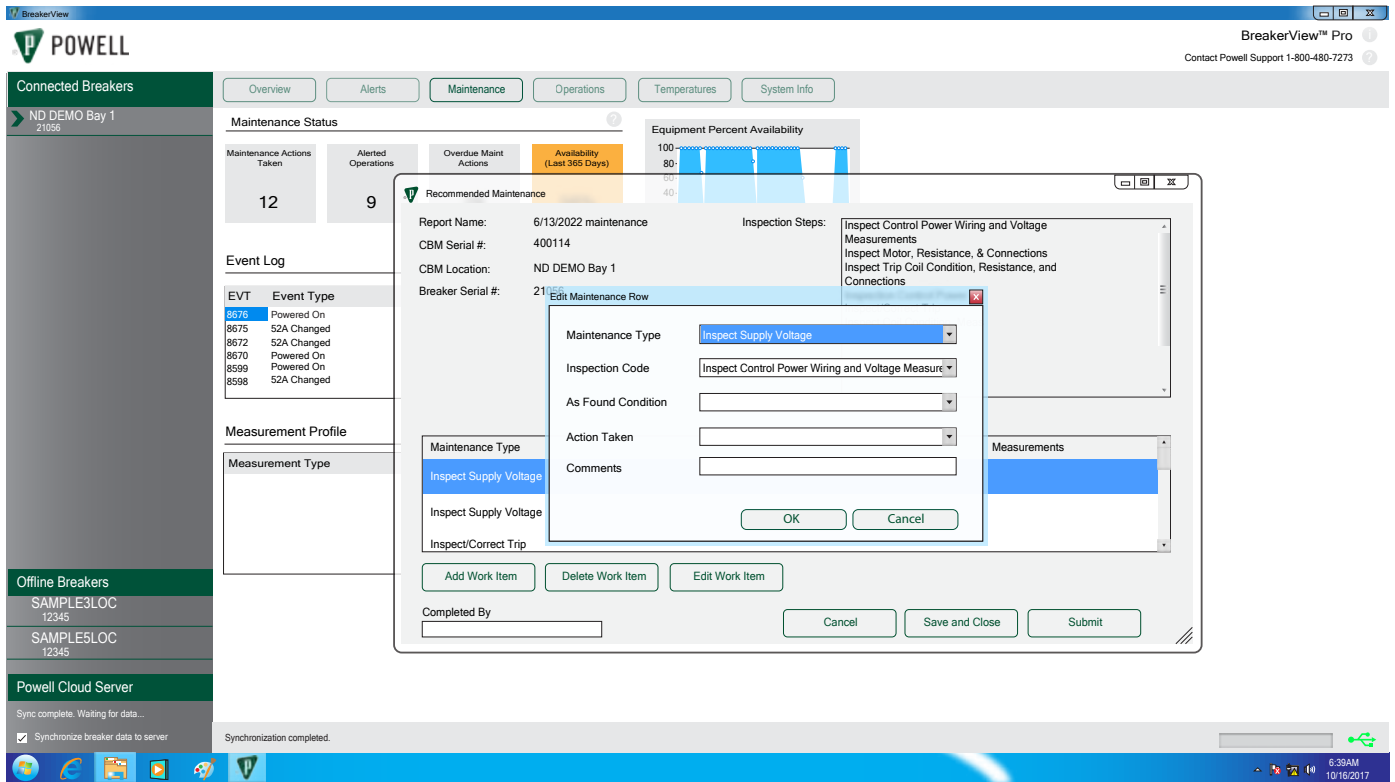
The "Form" icon  (Figure 16, D) permits accessing a standard periodic maintenance report into which any portion of maintenance and measurements of the breaker can be recorded, i.e., when contact resistance measurements are made, the values will be recorded here. See Figures 20 & 21.

Figure 17 View of Pop-up Display After Clicking the Wrench Symbol



A. "Edit Work Item" Button

Figure 18 Edit Work Item in Recommended Maintenance



When viewing the pop-up "Recommended Maintenance" list (Figure 17), any work item can be recorded by selecting "Edit Work Item" (Figure 17, A).

Figure 19 Editing “As Found Condition” in Recommended Maintenance

Recommended Maintenance

Report Name: 6/13/2022 maintenance

CBM Serial #: 400114

CBM Location: ND DEMO Bay 1

Breaker Serial #: 21056

Inspection Steps:

Inspect Control Power Wiring and Voltage Measurements
Inspect Motor, Resistance, & Connections
Inspect Trip Coil Condition, Resistance, and Connections

21056

Edit Maintenance Row

Maintenance Type

Inspect Supply Voltage

Inspection Code

Inspect Control Power Wiring and Voltage Measure

As Found Condition

Dirty Breaker
Poor Lubrication
Improper Supply Voltage
Mis-adjusted trip latch
Mis -adjusted close latch
Mis-adjusted charging system
Improper contact gap
Improper nut gap

Action Taken

Comments

Maintenance Type

Inspect Supply Voltage

Inspect Supply Voltage

Inspect/Correct Trip

Add Work Item

Delete Work Item

Edit Work Item

Completed By

Cancel

Save and Close


Submit

Measurements

Drop down menu items are utilized making quick data entry possible. A comments field allows for a user to enter details amplifying the standard working of the drop down menu as needed. This data will be recorded into the BreakerView™ database as is all other data associated with the CBM System.

Figure 20 Standard Maintenance Form - Customer Information Section

Breaker View

 **POWELL**

Inspection and Diagnostic Tool

Contact Powell Support: 1-800-480-7273

Create Maintenance Record

Breaker Serial12345Breaker NameSAMPLE3CCBM Serial499999

Customer Info

As Received

Maint. Checks

Breaker Tests

Work Performed

Customer Information

Customer

Address

User

Plant Location

Substation

Equipment ID

Page

Job #

Asset ID

Ambient Temp (F)

77

Humidity (%)

25

Device ID

Project Information

Powell Project #

Customer P.O.

Wiring Diagram #

Rating Upgrade (MVA/kA)

Project Type

☐ Maintenance

☐ Repair

☐ DD Mechanism

☐ Other

Cancel

Save

Submit

Offline

Data

System Info

Percent Availability

nt availability not available.

Recommended Maintenance

Coil

ge Coil Connections

ge Coil

arging System

ase Current

aker Phase Continuity

ient Temperature


All Recommended Maint.

ne Maintenance Report

Maintenance Reports

Open Report


01.4UM.48072A

 **POWELL**

23

Figure 21 *Data Entry Page for Breaker Measurements Permitting Submission of Values to the Database*

BreakerView

Inspection and Diagnostic Tool
Contact Powell Support 1-800-480-7273

Create Maintenance Record

Breaker Serial12345Breaker NameCBM Serial499999

Customer InfoAs ReceivedMaint. ChecksBreaker TestsWork Performed

Breaker Tests

Overtravel Gap

ΦA or Φ1ΦB or Φ2ΦC or Φ3

As Found

As-Left

Contact Travel ("Stroke") Value

ΦA or Φ1ΦB or Φ2ΦC or Φ3

As Found

As-Left

Contact Resistance

ΦA or Φ1ΦB or Φ2ΦC or Φ3

Micro-ohms μΩ

Vacuum Integrity

ΦA or Φ1ΦB or Φ2ΦC or Φ3

Pass/FailChooseChooseChoose

Breaker Tested in "Open" Position to Ground

DC Hi-Potential5KV - 19KV DC15KV - 37KV DC38KV - 60KV DC

123

μAμAμA

(Micro-amps)

Breaker Tested in "Closed" Position to Ground

DC Hi-Potential5KV - 19KV DC15KV - 37KV DC38KV - 60KV DC

123

μAμAμA

(Micro-amps)

CancelSaveSubmit

System Info

Percent Availability
availability not available.

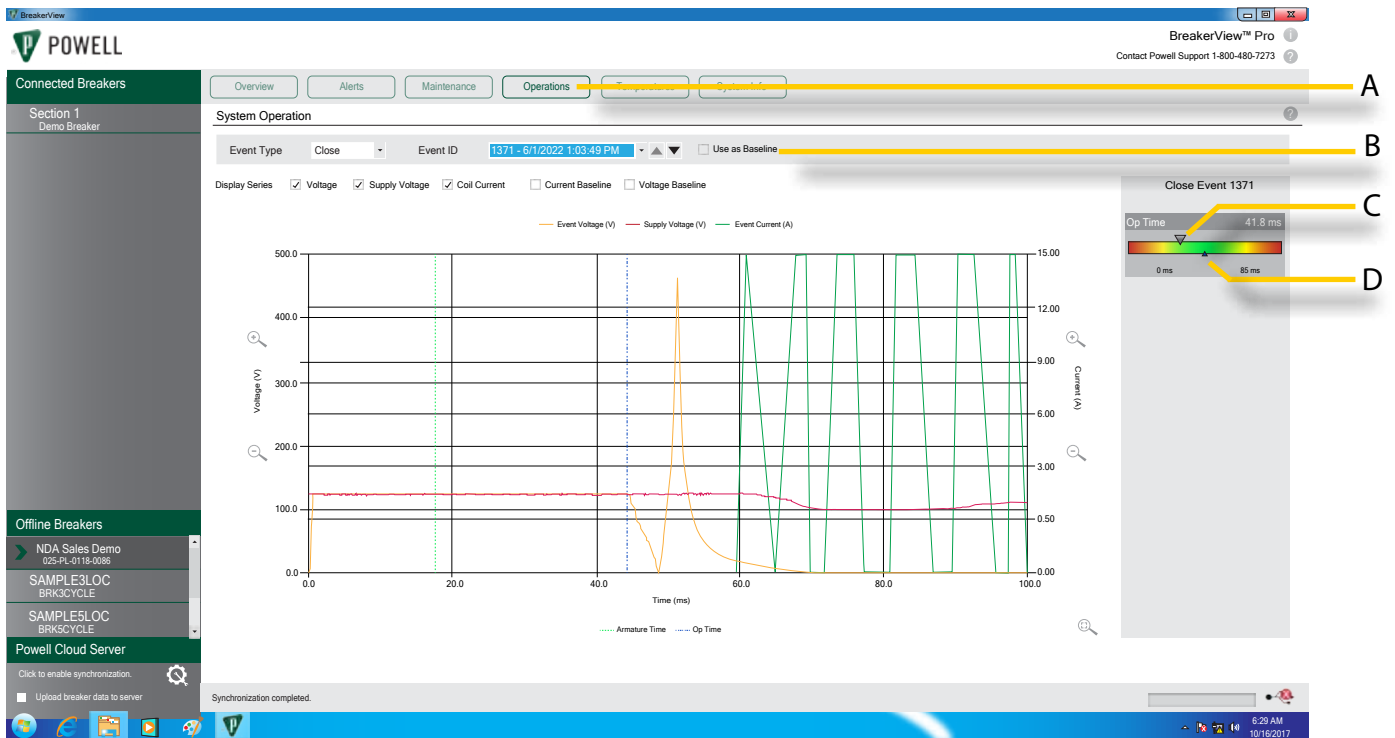
Recommended Maintenance
Coil
e Coil Connections
e Coil
arging System
se Current
ker Phase Continuity
ient Temperature

All Recommended Maint.
ne Maintenance Report
ntenance Reports
Open Report

4) Operations Screen

The Operations screen (Figure 22) provides voltage and current plots for the selected event with the event type shown based on the event ID selected. The right hand side gray box shows graphically on a set of colored bands with selected event performance indicators (dark gray pointer) compared to baselines (blue pointer) as shown in Figure 23. For trip and close, the timing is shown. Charging events show spring charging time as well as provide the parameter of time as a gray pointer within the acceptable band compared to the baseline blue pointer.

Figure 22 *Operations Screen Presents the Voltage, Current, Timing, and Baseline Values for the Close Event*



- A. "Operations" Button
- B. "Baseline" Selection Box
- C. Event Performance Indicator
- D. Baseline Indicator

Various operation data plots can be selected or removed by clicking on the box of the plot type of concern. In [Figure 22](#) the baseline current curve has been de-selected ([Figure 22, B](#)) to permit ease of viewing the coil current profile.

Figure 23 *Event Performance Indicators Showing a Close Event*

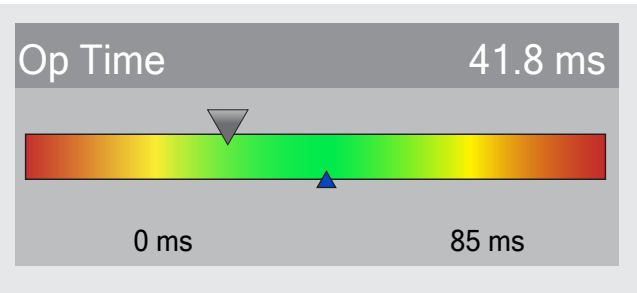


Figure 24 Charge Event Display of Voltages, Current, and Charge Time

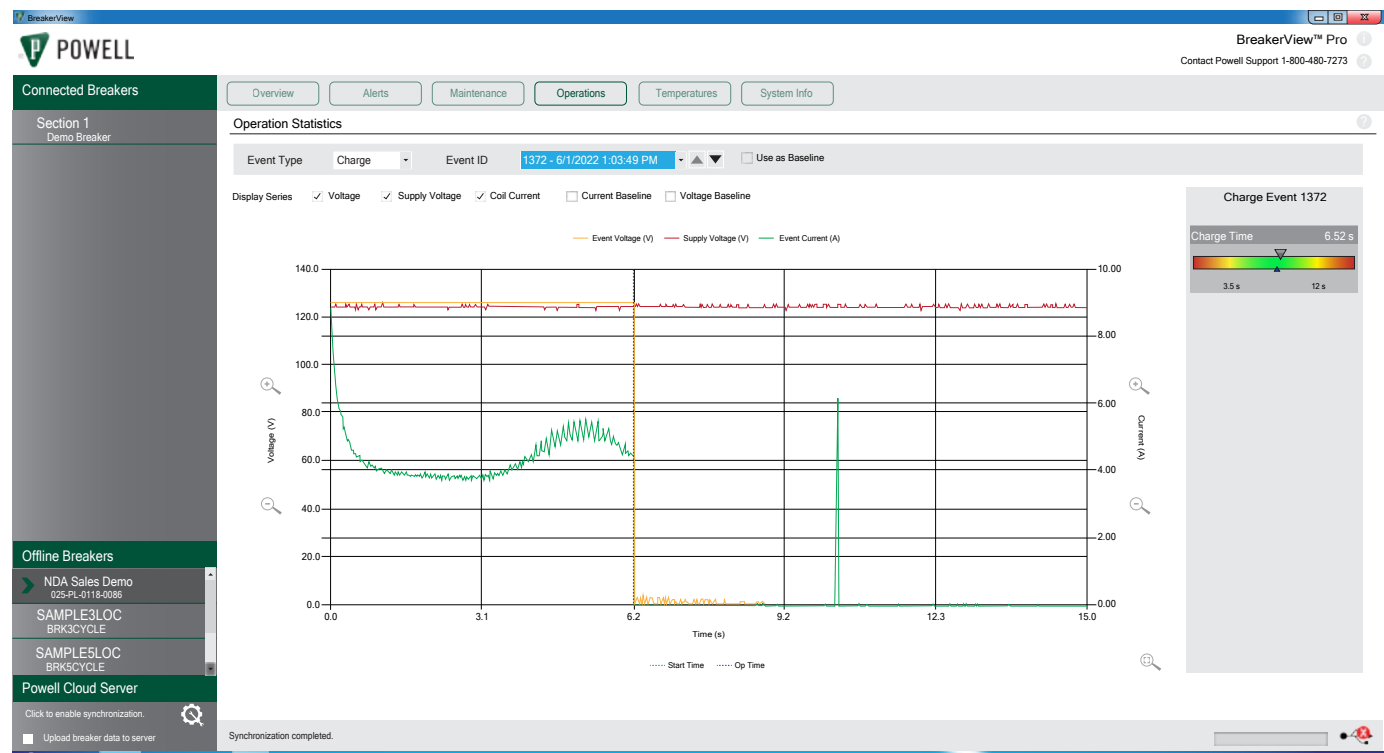


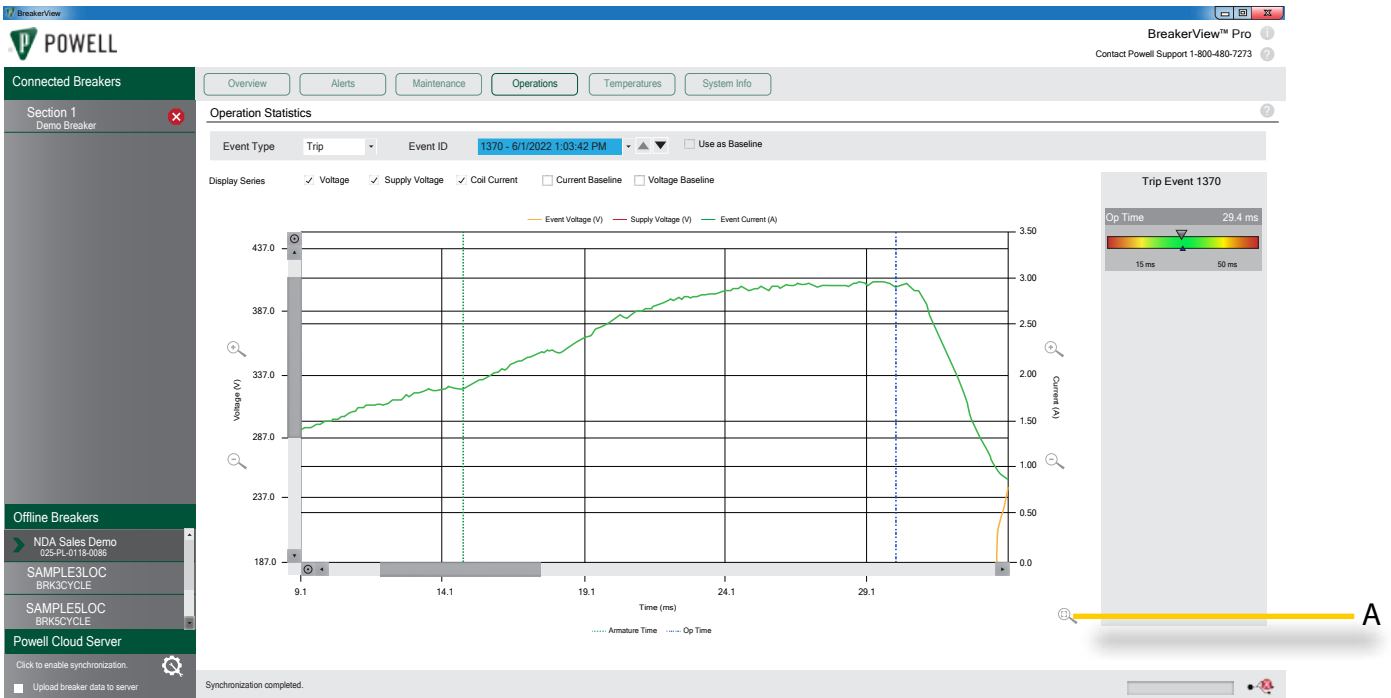
Figure 25 Selecting Plot for Magnification



A. Highlighted Section of Interest

Any set of curves can be expanded to observe details on a smaller scale by depressing the left mouse button and dragging across the area of interest. [Figure 25](#) shows the highlighted section selected.

Figure 26 Expanded Plot from Selected Area



A. "Magnifier" Icon

An expanded plot can be returned to its normal size by clicking on the "Magnifier" icon (Figure 26, A).



5) Temperatures Screen

The Temperatures screen (Figure 27) provides trending plots for supply voltage, ambient temperature, and phase temperatures. Temperature values can be filtered by event number and days prior to event or date range. These selections are made from the upper left hand side of the screen (Figure 27, B). Specific plots to be displayed are selected from the lower left hand screen (Figure 27, C). All plots are selected by default and by clicking on any box that plot can be unchecked for removal from the plot display.

Figure 27 Temperature Screen with all Plots Displayed



- A. "Temperatures" Button
- B. Temperature Event Filters
- C. Specific Plot Checkboxes to Display
- D. "Magnifier" Icon

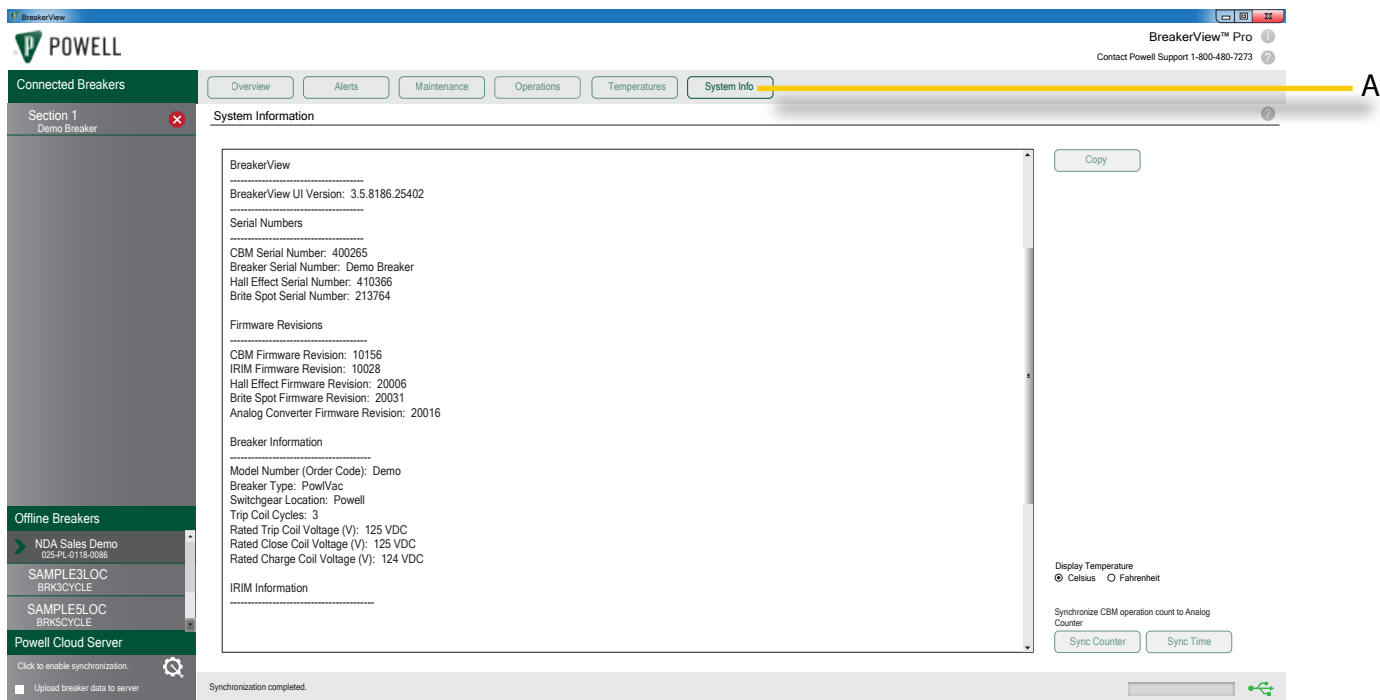
The Temperature screen permits selecting any portion and zooming in on it as was done with the operation screen plots.

After a plot is examined it can be returned to its previous size by clicking on the "Magnifier" icon (Figure 27, D) in the lower right hand corner of the plot borders.



6) System Information Screen

Figure 28 System Information Screen Displays the Details of CBM - i.e. Firmware Version & Limits



A. "System Information" Button

The System Information screen (Figure 28) allows the end user to view the details of firmware versions used for the CBM system modules, circuit breaker serial number, Hall Effect serial number, BriteSpot serial number, device voltage ratings, switchgear location, limits and more. These are the data fields that are populated into the CBM which capture basic information concerning the configuration of the circuit breaker and the CBM for ready reference when required.

Ch 3 Connecting BreakerView™ to the Circuit Breaker Monitor

A. CONNECTING BREAKERVIEW™ TO THE CIRCUIT BREAKER MONITOR (CBM) VIA USB

1) Prerequisites

- a. CBM with its associated EIM and IRIM setup
- b. Mini USB cable to connect to the EIM
- c. PC with BreakerView™ application installed

2) Connection

The connections between the system elements will be arranged as shown in [Figure 29](#).

Figure 29 Connection to On-Board Circuit Breaker Monitor via USB

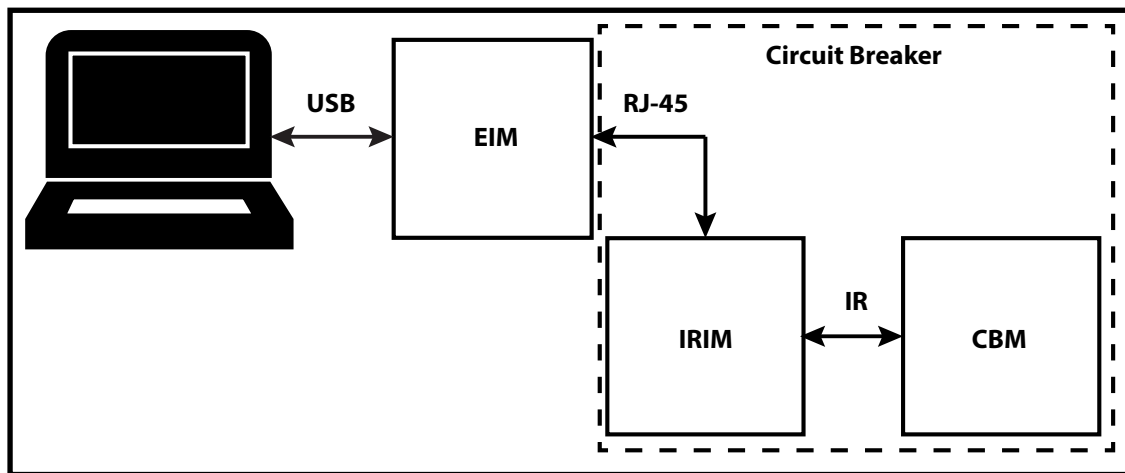
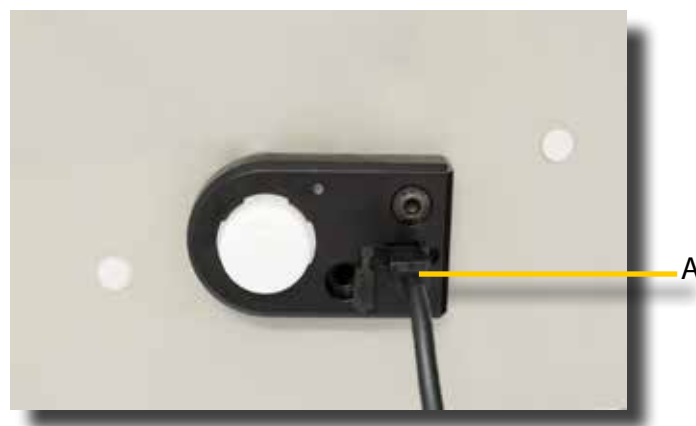


Figure 30 USB Connection to the EIM



A. USB to PC

- a. Connect the mini USB cable from PC to the EIM ([Figure 30](#)).
- b. Open the BreakerView™ application. Click the “Setting” icon ([Figure 12, A](#)) in the upper right corner of the screen.
- c. In the Application Maintenance screen, click “Edit Detection Mode” ([Figure 66, A](#)).
- d. Click “Technician/Sales” ([Figure 7](#)), this enables BreakerView to utilize the USB interface and sets the software to use automatic device detection.
- e. Close the Application Maintenance screen and restart BreakerView to apply the changes.
- f. Once BreakerView is reopened it will detect and display the information of the connected CBM via USB.

B. CONNECTING BREAKERVIEW™ TO THE CIRCUIT BREAKER MONITOR (CBM) VIA MODBUS RTU (SERIAL)

1) Prerequisites

- a. CBM with its associated EIM and IRIM setup
- b. 2-wire RS-485 cable
- c. USB to RS-485 converter (ex. EasySync ES-U-2101-M, ICP I-7561)
- d. PC with BreakerView application installed

2) Connection

The connections between the system elements will be arranged as shown in [Figure 31](#).

Figure 31 Connection to On-Board Circuit Breaker Monitor via Modbus RTU

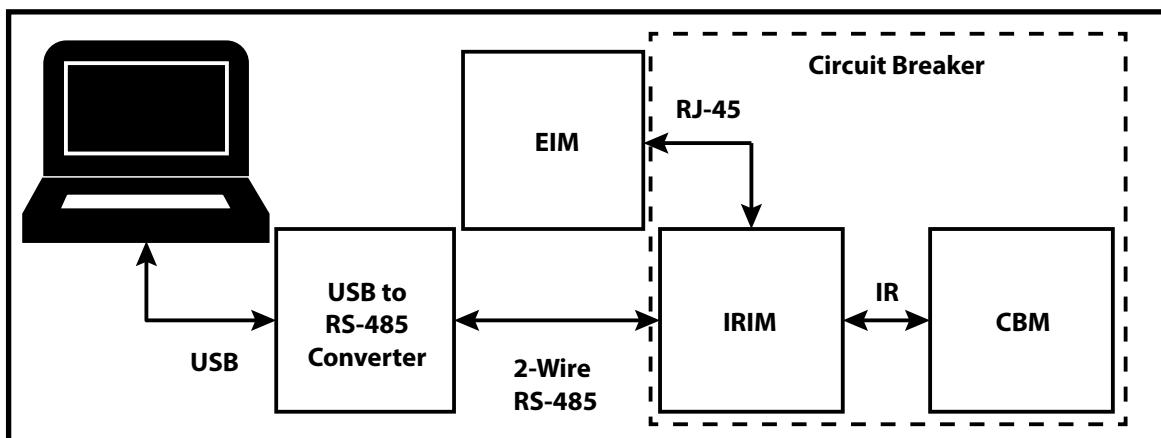


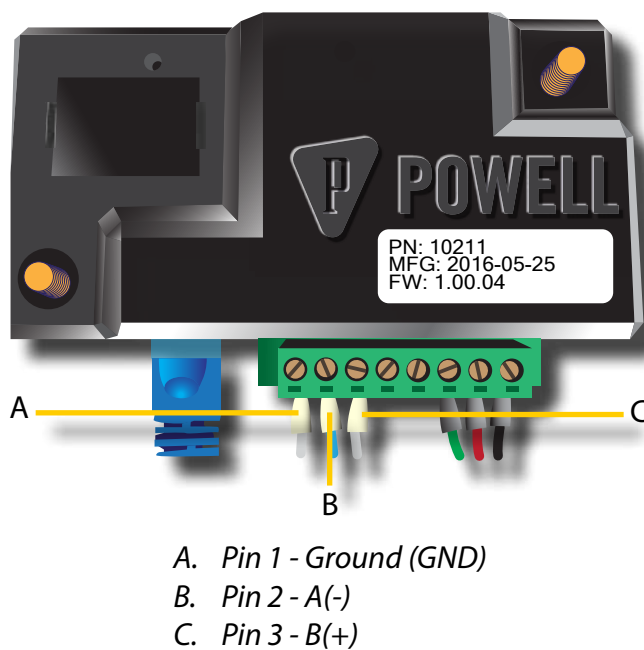
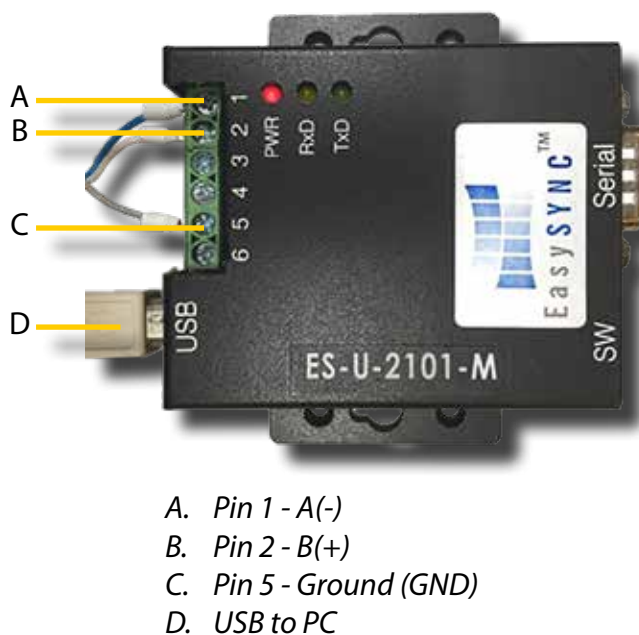
Figure 32 2-wire RS-485 Connection to the IRIM**Figure 33** 2-wire RS-485 connection to the EasySync ES-U-2101-M

Figure 34 2-wire TS-485 Connection to the ICP I-7561

- A. USB To PC
- B. Data -
- C. Data +

- a. Connect the 2-wire RS-485 cable from the IRIM (Figure 32) to the USB to RS-485 converter (Figure 33 & Figure 34). Refer to the most recent version of the Circuit Breaker Monitor Instruction Bulletin for more wiring information.
- b. Connect the USB to RS-485 converter to the PC via USB port (Figure 33 & Figure 34).
- c. Open the BreakerView™ application. Click the "Setting" icon (Figure 12, A) in the upper right corner of the screen.
- d. In the Application Maintenance screen accessed through the settings icon, click "Edit Detection Mode" (Figure 66, A).
- e. Click "Site Operation" (Figure 7), this will allow BreakerView to choose a COM port for Modbus communication.
- f. Click "Re-scan Ports" to scan for available devices. When scanning is complete, select the appropriate COM port where the USB to RS-485 converter is connected.
- g. Select the CBM Slave Devices that are connected to the Modbus Network.
- h. Click "OK" and close the Application Maintenance screen and restart BreakerView™ to apply the changes.
- i. Once BreakerView is reopened it will detect and display the information of the connected CBMs in the Modbus network.

Note: The settings used for communication between BreakerView software and the CBM is always 115200 baud, 8 data bits, no parity, and 1 stop bit. These parameters cannot be changed. The IRIM Production Assistant Tool can be used to configure the IRIM communication parameters (e.g. Modbus ID, baud rate, etc). Download the IRIM Production Assistant at breakerview.powellind.com. Changing the baud rate is only applicable when the IRIM is not connected to BreakerView software using Modbus RTU.

C. CONNECTING TO THE CIRCUIT BREAKER MONITOR (CBM) VIA MODBUS TCP (ETHERNET)**1) Prerequisites**

- a. CBM with its associated EIM and IRIM setup
- b. 2-wire RS-485 cable
- c. Moxa MGate MB3170 (or similar)
- d. Ethernet Cable (RJ-45)
- e. MGate Manager software to configure the Moxa MGate MB3170. Refer to the product manufacturer for more information.
- f. PC with BreakerView™ application installed.

2) Connection

The connections between the system elements will be arranged as shown in [Figure 35](#).

Figure 35 Connection to On-Board Circuit Breaker Monitor via Modbus TCP

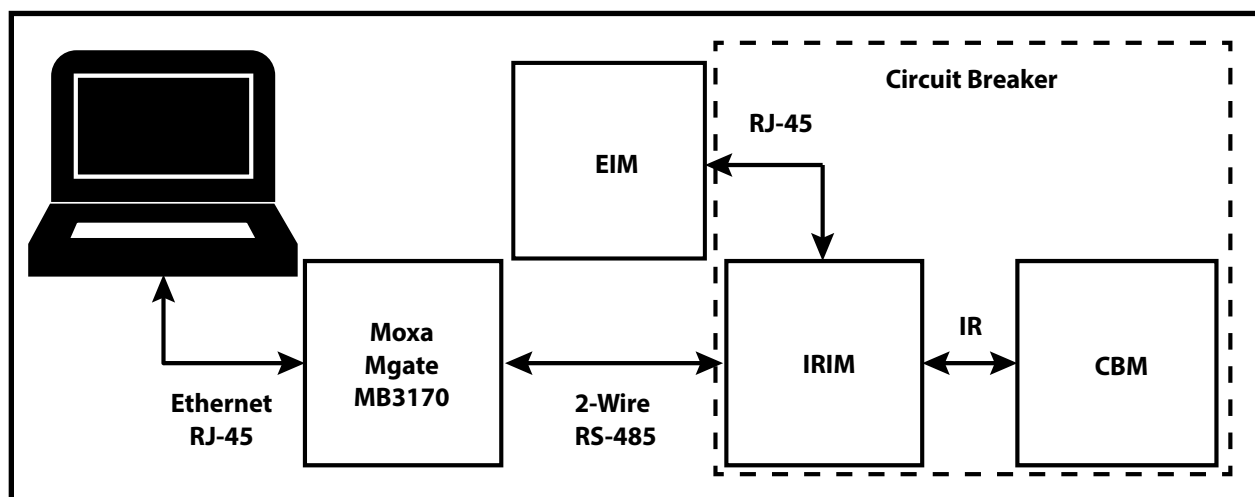


Figure 36 Ethernet Connection to the Moxa MGate MB3170

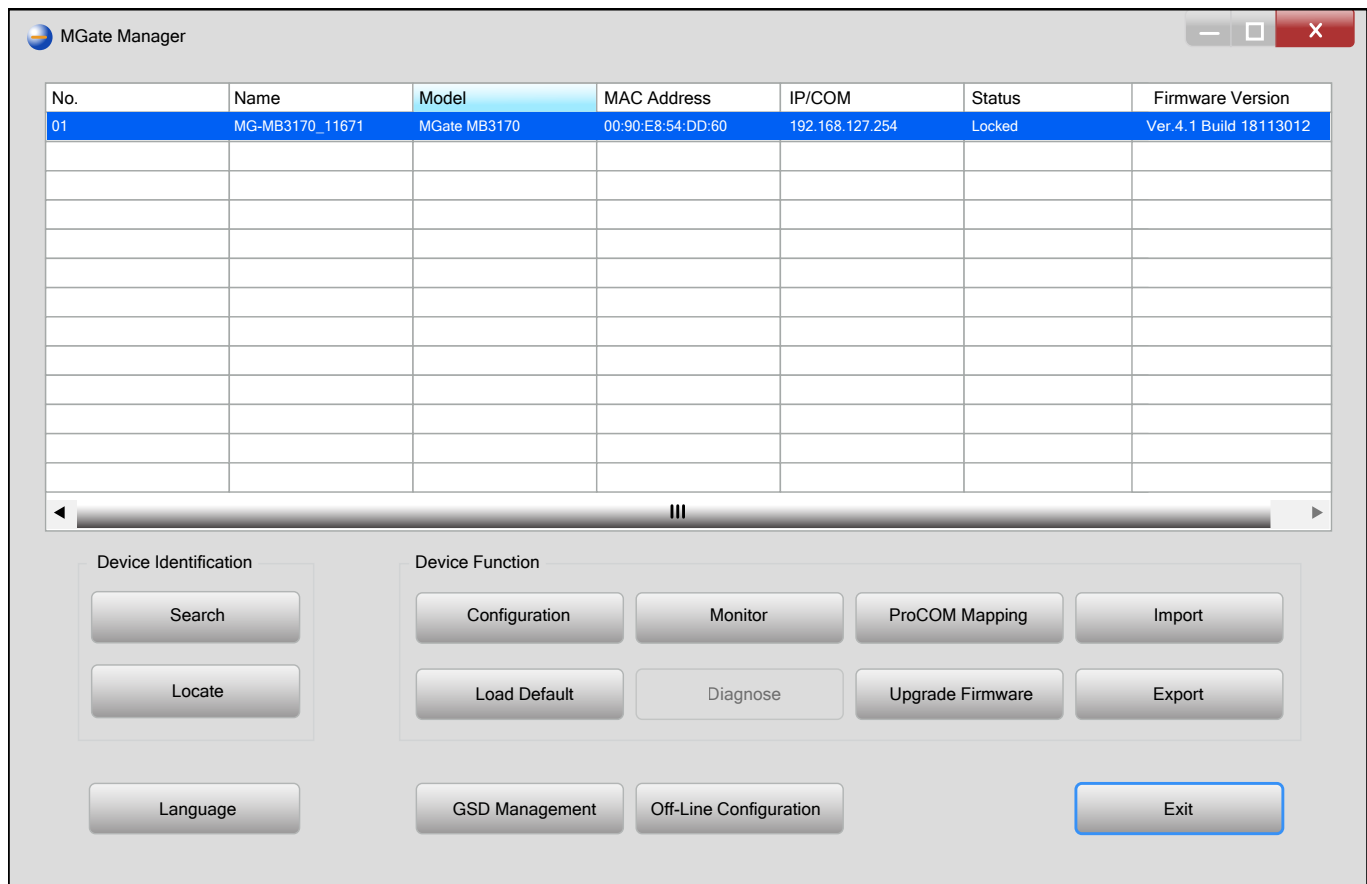
A. Ethernet Cable to PC

Figure 37 2-wire RS-485 Connection to the Moxa MGate MB3170

A. Pin 3 - Data (+)
B. Pin 4 - Data (-)
C. Pin 5 - Ground (GND)

- a. Connect the 2-wire RS-485 cable from the IRIM (Figure 32) to the Moxa MGate MB3170 (Figure 37).
- b. Connect the Moxa MGate MB3170 to the PC via ethernet cable (Figure 36).
- c. Configure the IP settings of the Moxa MGate MB3170 to static using MGate Manager Application. Please refer to the Moxa documentation for details of how to perform this procedure. The following is provided for guidance only.
 - i. Open the MGate Manager.
 - ii. Click "Search". When the search is completed, the device will appear in the device list (Figure 38).

Figure 38 *MGate Manager*



- iii. Login to the device and enter the following:
 - User: admin
 - Password: moxa
- iv. In the Network tab ([Figure 39](#)), set the Network Configure to Static. Complete the following configuration fields:
 - IP address: 192.168.1.50 (192.168.1.x, x is anything between 2-255)
 - Subnet mask: 255.255.255.0
 - Gateway: 192.168.1.1

NOTICE

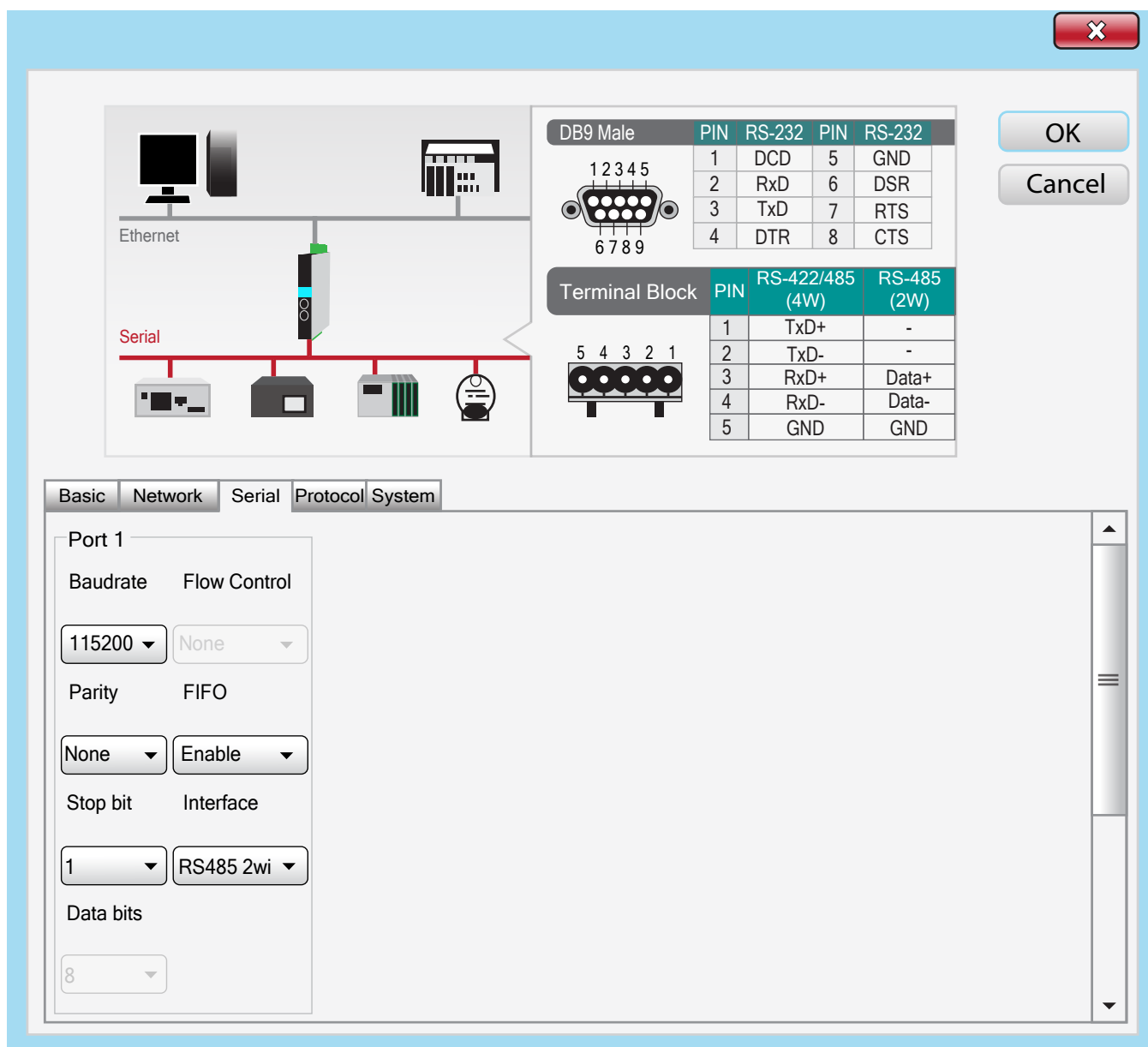
All network settings provided in this document are examples. The user should contact their IT department for instruction regarding the settings to use for each particular installation.

Figure 39 MGate Manager Network Settings



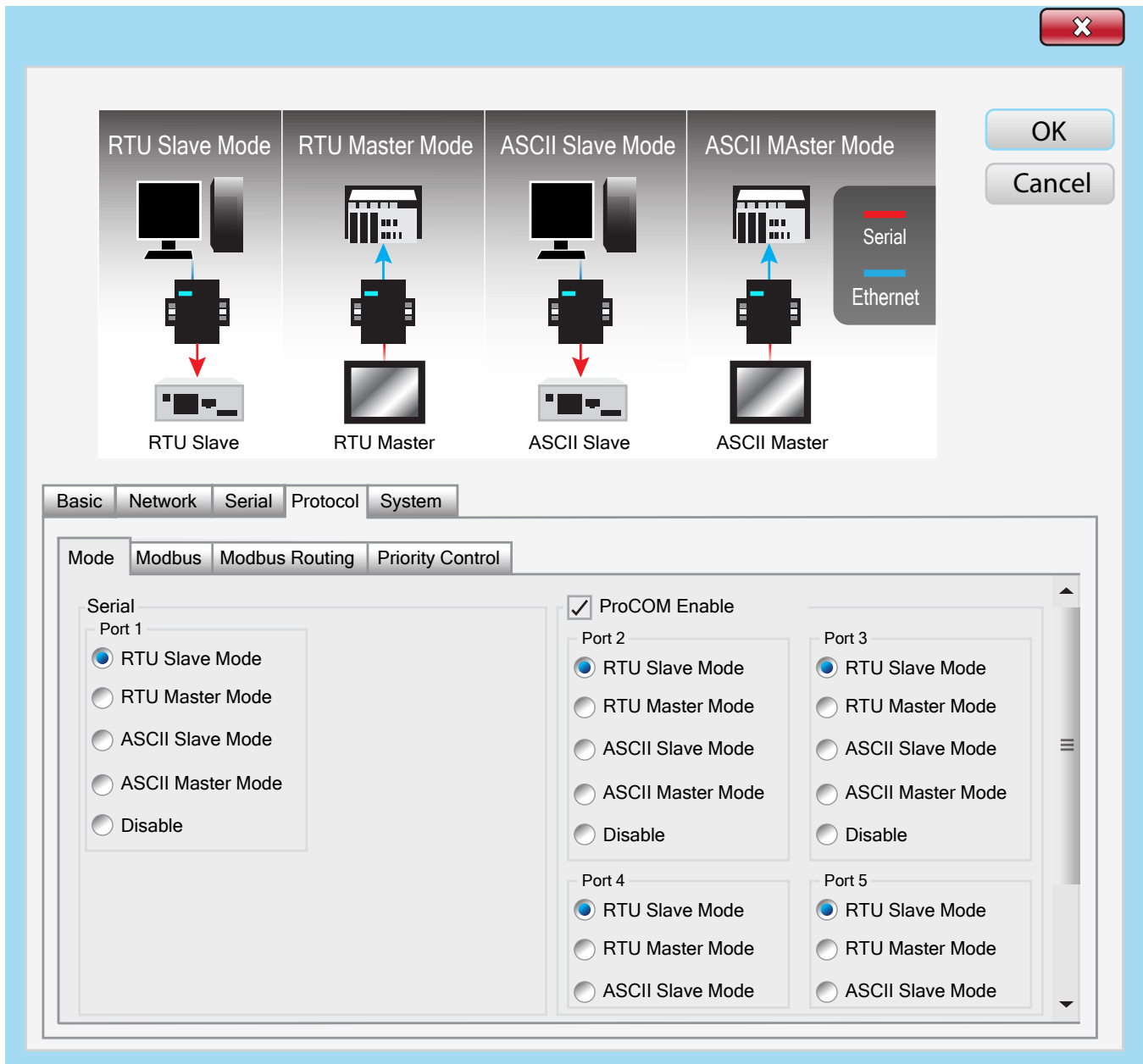
- v. In the Serial tab (*Figure 40*), complete the following configuration fields:
- Port 1
 - Baud rate: 115200 (or the one configured using the IRIM Production Assistant tool)
 - Flow Control: None
 - Parity: None
 - FIFO: Enable
 - Stop bit: 1
 - Interface: RS-485 2-wire
 - Data bits: 8

Figure 40 *MGate Manager Serial Settings*



- vi. In the Protocol tab ([Figure 41](#)), set the Serial Port 1 to RTU Slave Mode.

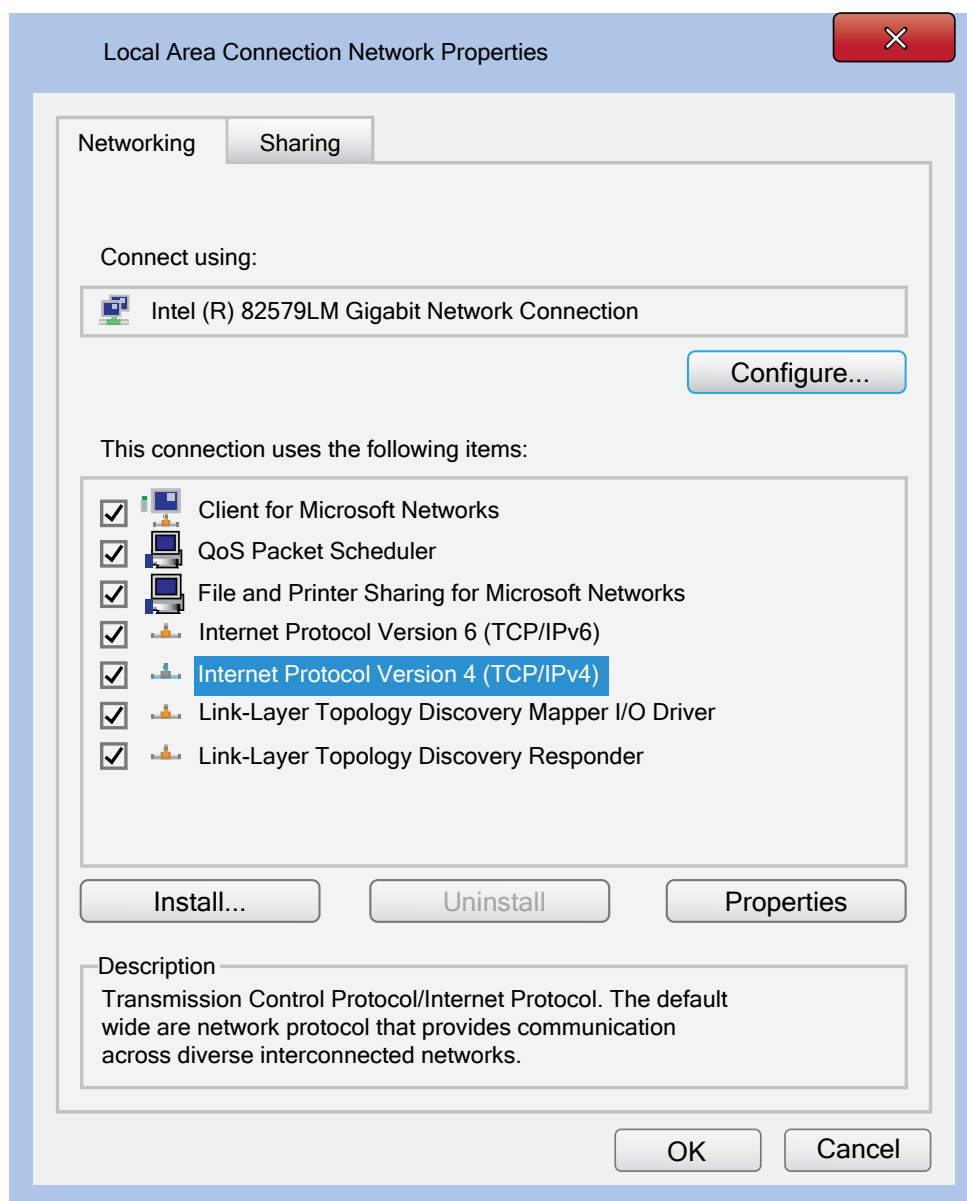
Figure 41 MGate Manager Protocol Settings



- vii. Click "OK". A message box and an audible "beep" from the Moxa MGate MB3170 will confirm the changes.

- d. Configure the IP settings of the PC to static IP. The following screens are based on Microsoft Windows 10 and should be used for reference only. The user should discuss any network configuration changes with their IT administration group before making these changes.
 - i. Open the Start Menu and run Control Panel.
 - ii. Click on "Network and Sharing Center".
 - iii. From the task list from the left, select Change Adapter Settings.
 - iv. Right click on the "Local Area Connection (Ethernet)" and click "Properties".
 - v. Select Internet Protocol Version 4 (TCP/IPv4) (*Figure 42*).

Figure 42 PC Local Area Connection (Ethernet) Properties

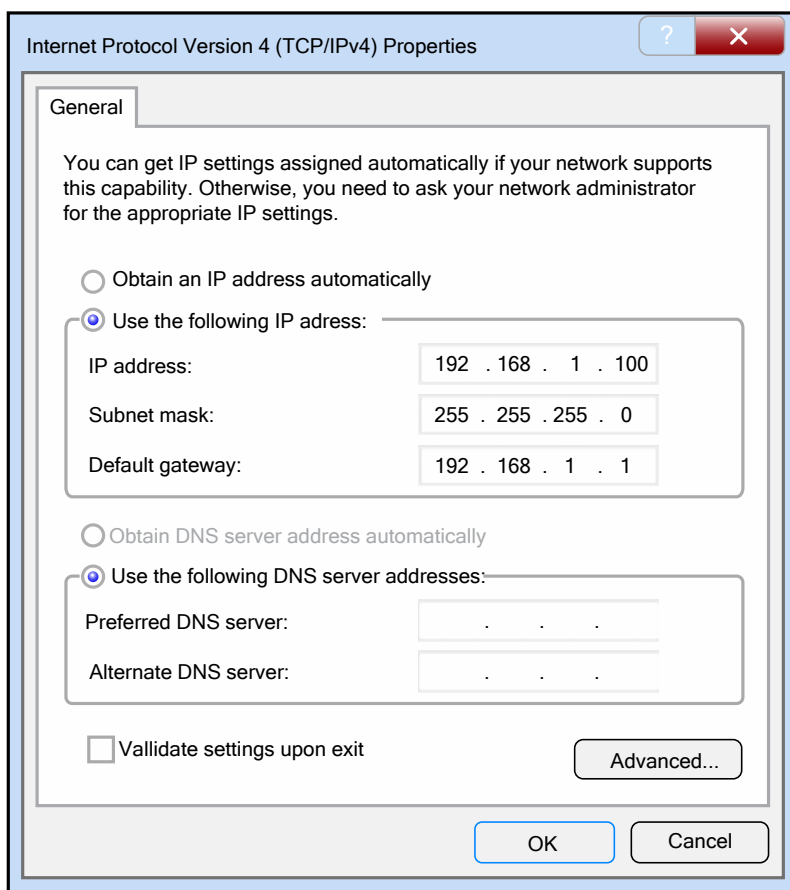


- vi. Click on the “Use the following IP address” radio button and complete the configuration fields (*Figure 43*).
- IP address: 192.168.1.100 (192.168.1.x, x is anything between 2-255. The PC and the Moxa MGate MB3170 should not have the same IP address.)
 - Subnet mask: 255.255.255.0
 - Default gateway: 192.168.1.1

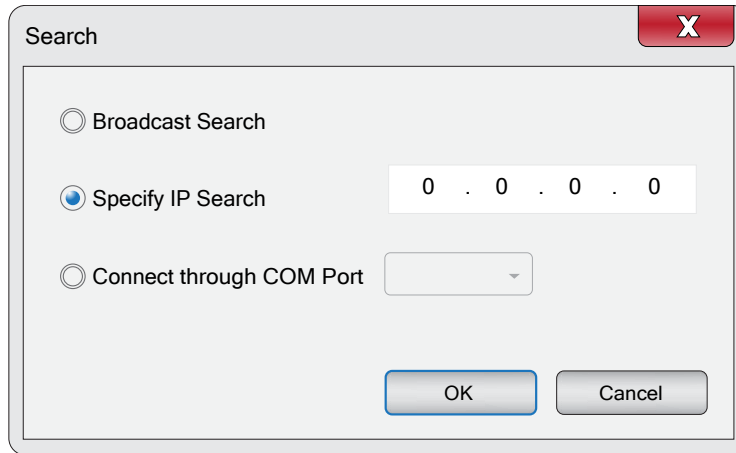
NOTICE

All network settings provided in this document are examples. The user should contact their IT department for instruction regarding the settings to use for each particular installation.

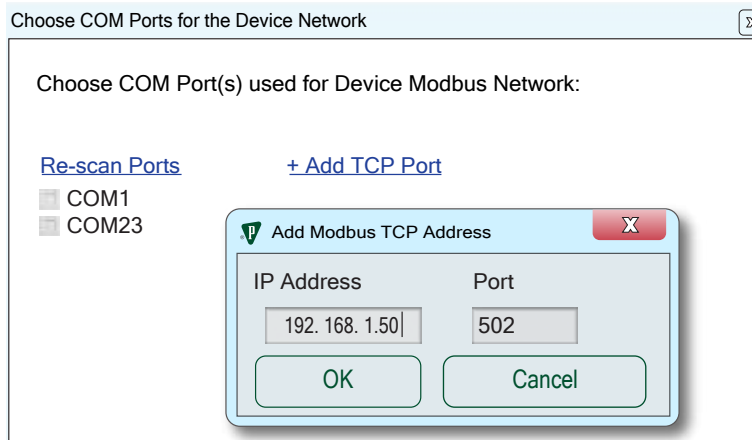
Figure 43 PC Internet Version 4 (TCP/IPv4) Properties Protocol



- vii. Click “OK” and exit the Local Area Connection Properties.
- viii. To verify the communication of the PC and Moxa MGate MB3170 reopen the MGate Manager.
- ix. Click “Search”, select Specify IP Search and enter the IP address of the MGate MB3170 (*Figure 44*).

Figure 44 MGate Manger Search Device

- x. Click "OK". After the search the Moxa MGate MB3170 will appear on the device list.
- e. Open the BreakerView™ application. Click the "Setting" icon in the upper right corner of the screen.
- f. In the Application Maintenance screen, click "Edit Detection Mode" (Figure 66, A).
- g. Click "Site Operation", this will allow BreakerView to choose a TCP port for Modbus communication.
- h. Click "Add TCP Port" to enter the IP Address of the Moxa MGate MB3170 (Figure 45).

Figure 45 BreakerView™ Add TCP Port

- i. Select the CBM Slave Devices that are connected to the Modbus Network.
- j. Click "OK". Close the Application Maintenance screen and restart BreakerView to apply the changes.
- k. Once BreakerView is reopened it will detect and display the information of the connected CBMs in the Modbus network.

Note: The baud rate used for communication with BreakerView is set to 115200. The IRIM Production Assistant Tool can be used to configure the IRIM communication parameters (e.g. baud rate). Download the IRIM Production Assistant at breakerview.powellind.com.

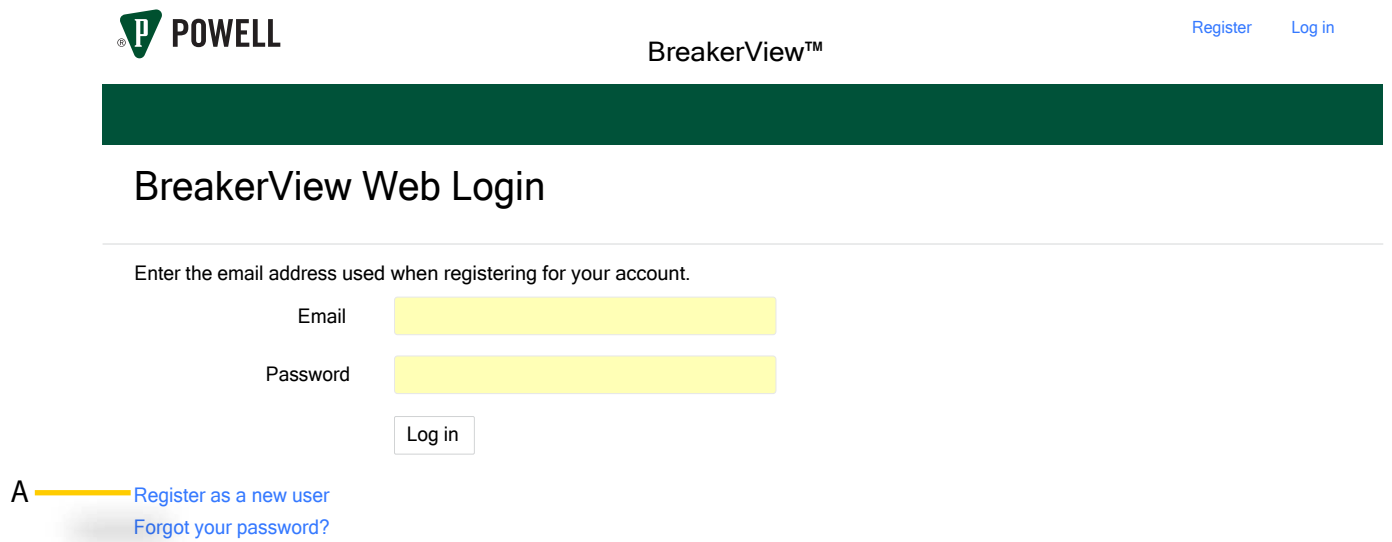
Ch 4 BreakerView™ Software and Equipment Registration

A. BREAKERVIEW™ CLIENT EQUIPMENT REGISTRATION

This procedure provides user instructions for registering PowlVac® or Power/Vac® circuit breakers with CBM into Powell BreakerView™ Web and BreakerView Desktop software applications.

- 1. Login to BreakerView Web
 - a. Begin breaker registration for new circuit breaker(s) with CBM by logging into BreakerView Web at breakerview.powellind.com.
 - i. For new users, or those that need to create a new user account, click the “Register as a new user” link shown in [Figure 46](#) and follow the online screen instructions to create the new user account.
 - ii. Previously registered BreakerView users can open and log into BreakerView Web using their email URL and previously saved password.

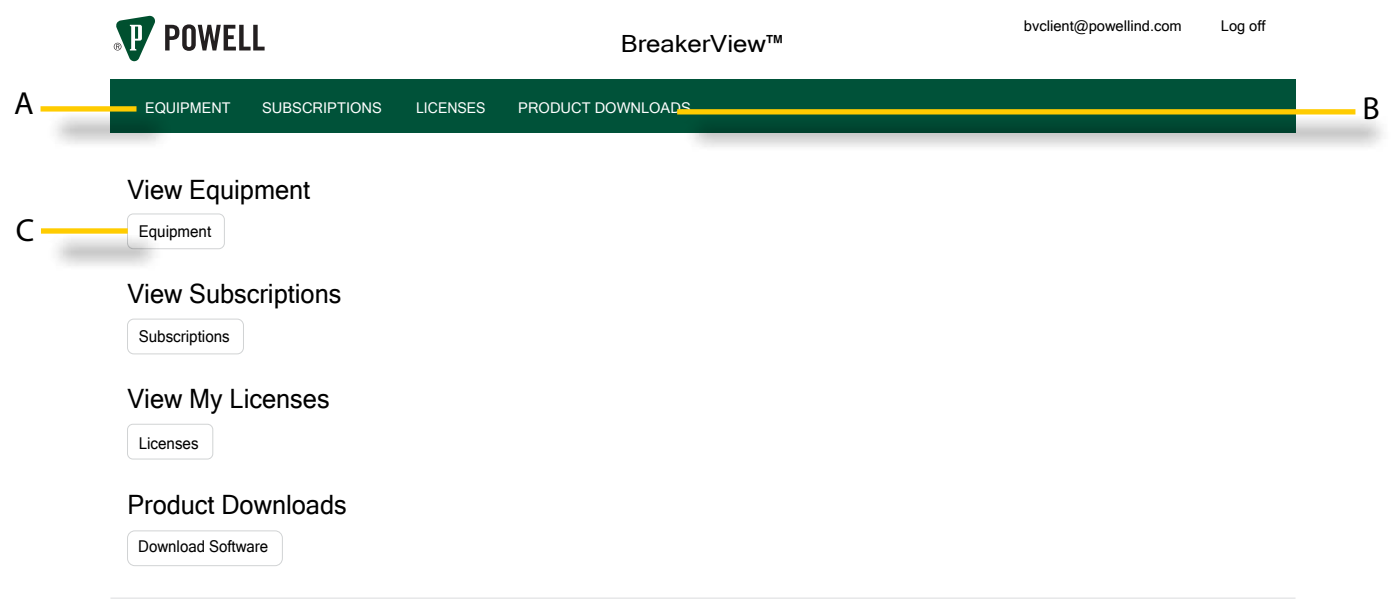
Figure 46 BreakerView™ Web Login Screen



A. Click “Register as a new user”

2. In the BreakerView™ Web “Main Screen”, navigate to the “Equipment” screen by either clicking the upper left “Equipment” label (Figure 47, A) on the menu ribbon, or by clicking the “Equipment” button (Figure 47, C) under the “View Equipment” header label.

Figure 47 BreakerView™ Web Main Screen



- A. “Equipment” Label on Menu Ribbon
- B. “Product Downloads” Label on Menu Ribbon
- C. “Equipment” Button

3. After navigating to the “Equipment” page, click on the “Register New Equipment” link (Figure 48, A) to open the “Equipment Registration” screen shown in Figure 48.

Figure 48 BreakerView™ Web Equipment Screen

POWELL

BreakerView™

bvclient@powellind.com

Log off

EQUIPMENT

SUBSCRIPTIONS

MY LICENSES

PRODUCT DOWNLOADS

Equipment

CBM

Print

A

+ Register New Equipment

Search

Powell SO Number	Owner	Owner Project Ref.	Breaker Serial Number	CBM Serial Number	Breaker Location	Last Update	Status
---	---	---	025-PL-1020-0115	401132	EDA QAQC	11/3/2020 12:19:11 PM	✓
---	---	---	BRK3CYCLE_DBG	400100	DEBUG3LOC	3/10/2020 6:59:55 PM	▲
---	---	---	BRK5CYCLE_DBG	400101	DEBUG5LOC	3/10/2020 6:59:55 PM	▲
---	---	---	BSN400111	400111	VAIT TEST SECTION1	5/5/2020 12:00:21 PM	▲
---	---	---	025-PL-0917-0018	400112	Unit 12 52-24 to Motor 14-1802	9/6/2018 11:07:43 AM	▲
SO123456DEMO	Powell	DEMO	21056	400114	ND DEMO Bay 1	4/19/2018 3:38:16 PM	▲
---	---	---	test breaker #6	400114	ND DEMO Bay 1	12/12/2019 3:07:08 PM	▲
---	---	---	025-PL-0917-0012	400117	Unit 6 52-1 Main	9/6/2018 10:59:25 AM	▲
---	---	---	025-PL-0917-0007	400201	---	11/17/2017 10:40:54 AM	▲
---	---	---	025-PL-0917-0004	400202	---	11/10/2017 9:42:38 AM	▲

1

2

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...

»

»»

A. “Register New Equipment” Link

Figure 49 BreakerView™ Equipment Registration Screen

POWELL BreakerView™ bvclient@powellind.com Log off

EQUIPMENT SUBSCRIPTIONS LICENSES PRODUCT DOWNLOADS

Equipment Registration

Link Powell connected products to your account

The following information will allow us to link your Powell Cloud connected device(s) to your account.

Registration is usually automatic, however, in some cases may require additional information and take around 48 hours. Please add Powell_No-Reply@powellind.com to your address book or safe sender list to ensure e-mails containing license keys or other important messages are not sent to your junk or spam folder.

SO Number (from switchgear or nameplate)

Registration Code

Company Name

Owner Ref Number

Site Information

Site location information is requested to allow our support team to provide improved service based on your region.

Unit Name

Substation / Site Location Reference

City

Zip Code

A

A. "Register Equipment" Button

4. After opening the "Equipment Registration" screen, begin registering the new CBM circuit breaker list by entering the Powell provided registration data at the right of the field labels below:
 - **SO Number:** enter Sales Order and Line Item number copied from "Welcome to BreakerView™" welcome letter.
 - **Registration Code:** enter Registration Code copied from "Welcome to BreakerView" welcome letter.
 - **Company Name:** enter Company Name copied from "Welcome to BreakerView" welcome letter.

Entry is required for these three top fields.

5. Users are encouraged to fill-in the remaining equipment registration fields:
 - Project Number
 - Unit Name
 - Substation/Site Location Reference Name
 - City
 - Zip Code


6. After completing entry of the equipment registration fields, click the “Register Equipment” button (Figure 49, A) to complete the BreakerView™ registration and licensing of the new SO Equipment List. BreakerView Web will automatically send the registering user an email message that provides a License Key and instructions for completing the license entry process within BreakerView Desktop. Once this step is complete, the registered devices will be visible on the BreakerView Web equipment screen.
7. After completing the license key installation, all of the PowlVac® or Power/Vac® circuit breakers with CBM and CBMs listed in the Powell entered SO Equipment List data set will be registered and accessible in the BreakerView Desktop application.

B. BREAKERVIEW™ DATABASE BUNDLE AND SOFTWARE USER MANUAL

1. For new BreakerView users registering CBM breakers for the first time, click the “Product Downloads” menu label from the BreakerView Web main screen (Figure 47, B) and download the latest version of “BreakerView Database Bundle” program, and the BreakerView User Manual prior to beginning the BreakerView Desktop License Key Installation in Ch 4 BreakerView Software and Equipment Registration, C. BreakerView Desktop License Key Installation.

Note: If the BreakerView software bundle has previously been downloaded and installed onto the user’s PC, proceed to Ch 4 BreakerView Software and Equipment Registration, C. BreakerView Desktop License Key Installation.

Figure 50 BreakerView™ Web Products Download Screen

 **POWELL**

BreakerView™

bvclient@powellind.com Log off

EQUIPMENT SUBSCRIPTIONS LICENSES **PRODUCT DOWNLOADS**

Product Downloads

Product Downloads for your equipment are listed below.

Product	Version	Installers	Manuals
BreakerView - Pilot	2.5.6726.27607	Download	User Manual
FTDI Driver Installer	2.0.0.0	Download	
IRIM Config Installer	1.0.0.0	Download	

A

B

C

A. “Download” Link

B. BreakerView X.X Database Bundle

C. “User Manual” Link

2. Once the BreakerView Database Bundle has been downloaded, follow the on-screen instructions to install the program to the user’s PC in order to complete the steps in Ch 4 BreakerView Software and Equipment Registration, C. BreakerView Desktop License Key Installation.
3. Open BreakerView Desktop to verify that it is installed correctly. Leave the BreakerView Desktop program open, as it will be used to complete the desktop license key installation in Ch 4 BreakerView Software and Equipment Registration, C. BreakerView Desktop License Key Installation.

C. BREAKERVIEW™ DESKTOP LICENSE KEY INSTALLATION

1. After receiving the BreakerView™ Web auto-send message, open the message and review the information and instructions provided similar to the example in [Figure 51](#).

Figure 51 Sample BreakerView™ Web Email Message

From: Powell_No-Reply@powellind.com
Sent: Wednesday, January 02, 2019 4:08 PM
To: Smith, John
Subject: Powell BreakerView: License Key for New CBM Breaker List

[External - Beware of links/attachments]

Hello John Smith.

Thank you for registering your new PowlVac CBM circuit breaker “SO list” into BreakerView-Desktop.
Your license key for registering these new CBM breakers is printed below.

Please retain this email for your records.

License Holder: John.Smith@powellind.com

CBM Serial Numbers linked with this new license key: 400325

If you have not downloaded and installed BreakerView-Desktop, go to <https://breakerview.powellind.com/Downloads>.

After login, if you are not automatically redirected to [Product Downloads](#) screen, click the “Product Downloads” label on the menu bar, download and install the BreakerView-Desktop program as-per the on-screen instructions.

If you have already downloaded BreakerView-Desktop from BreakerView-Web and installed the program onto your computer, find 'BreakerView-Desktop' within the Powell Industries program folder and click to open the program.

To install license key:

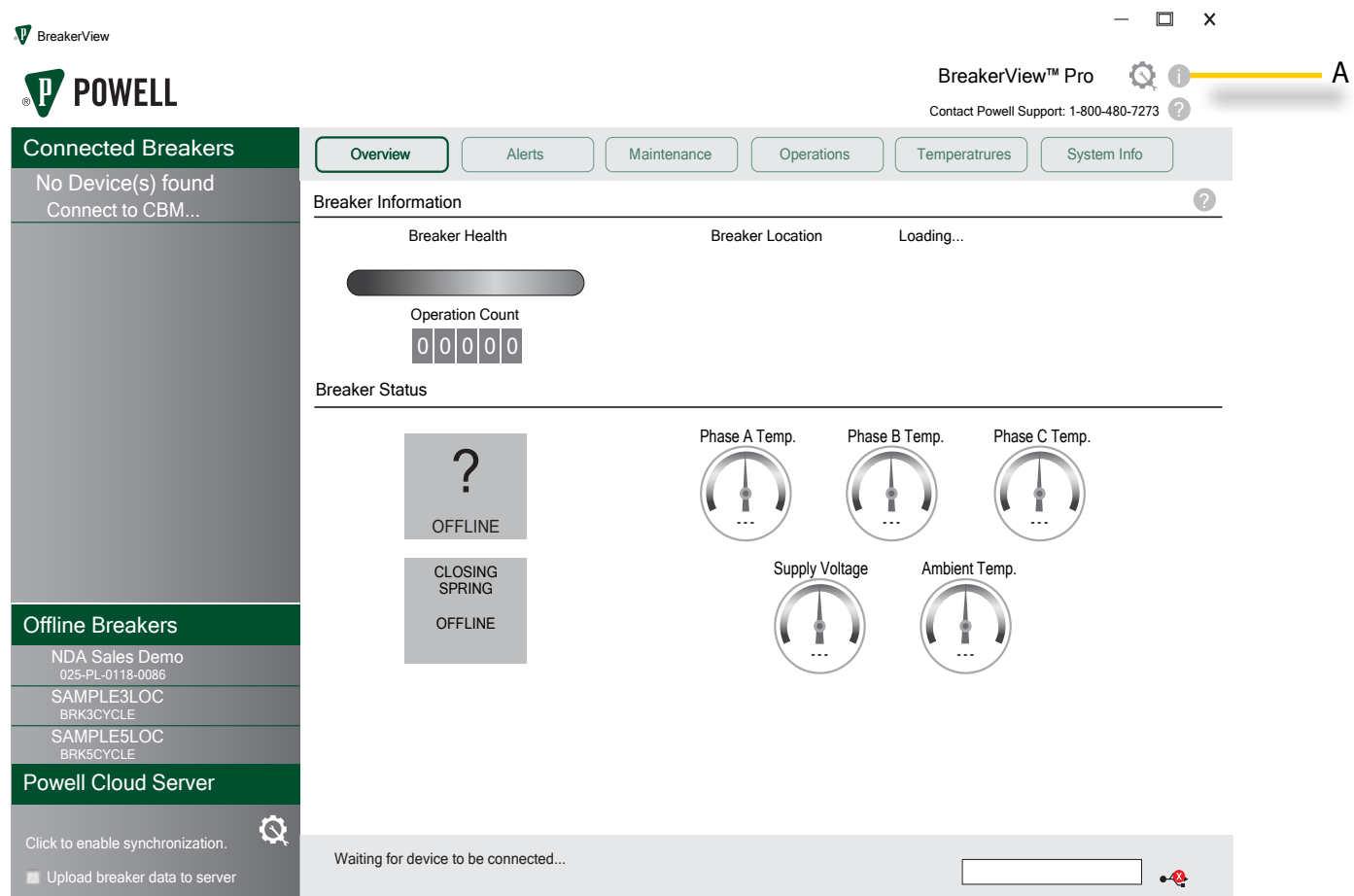
- 1. Copy entire bold section below.
- 2. Open BreakerView-Desktop and click on the information icon; “**i**” in the upper right corner of the screen.
- 3. Press the ‘**Update License**’ button, followed by ‘**Add New License**’.
- 4. Paste the license key data into the ‘Enter License Key’ field, and press ‘Add License’.

If you have any questions about this licensing procedure, please contact Powell Support at 1-800-480-7273.

[illegible]

- 2. Open the BreakerView™ Desktop program.
- 3. Click on the “Information” icon (Figure 52, A) at the upper right corner of the screen.

Figure 52 BreakerView™ Desktop Overview Screen



A. “Information” Icon

4. Click the “Update License” button (Figure 53, A) in the lower left corner of the Information Screen, this will open the “License Management” screen shown in Figure 54.

Figure 53 BreakerView™ Desktop Information Screen

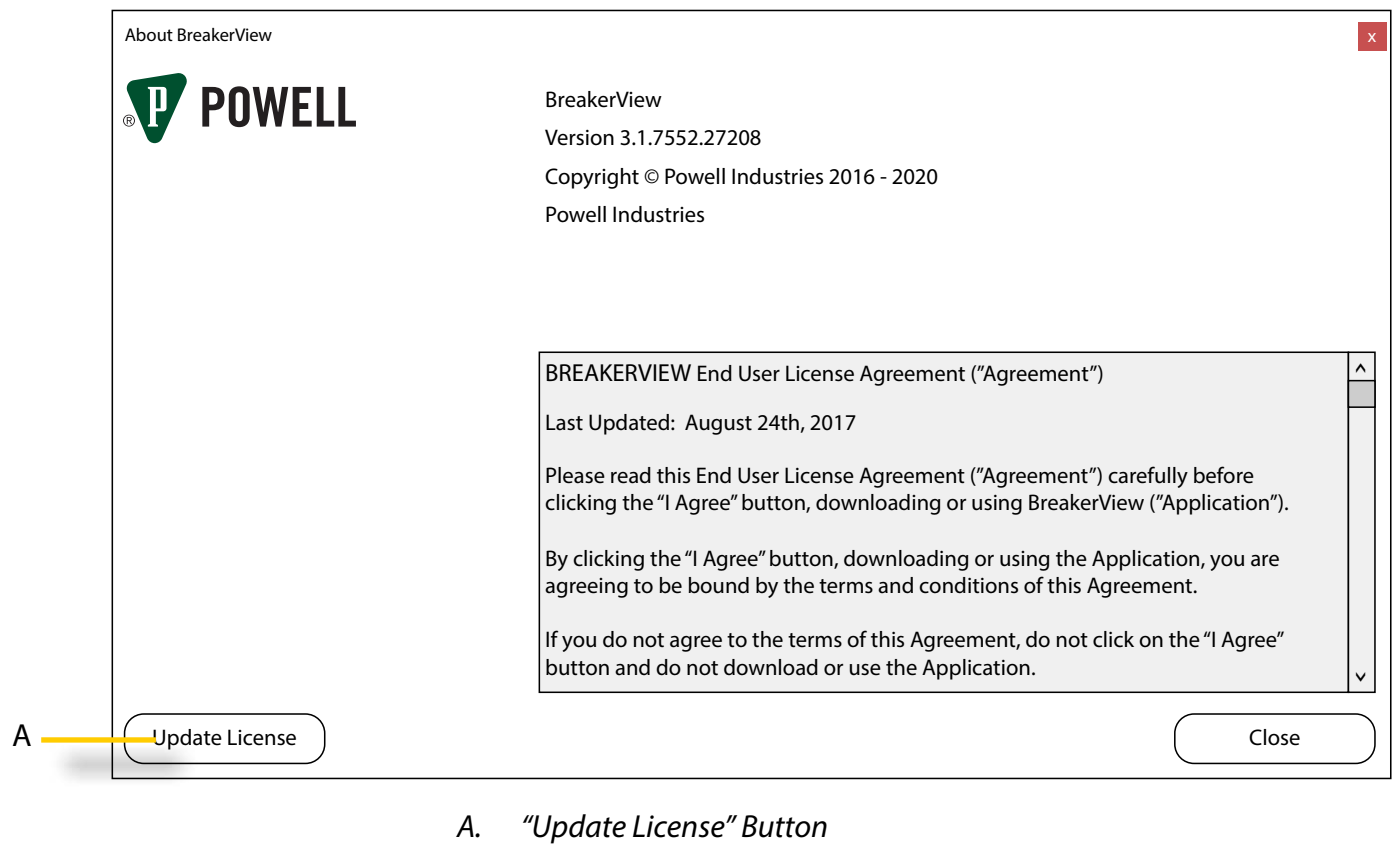
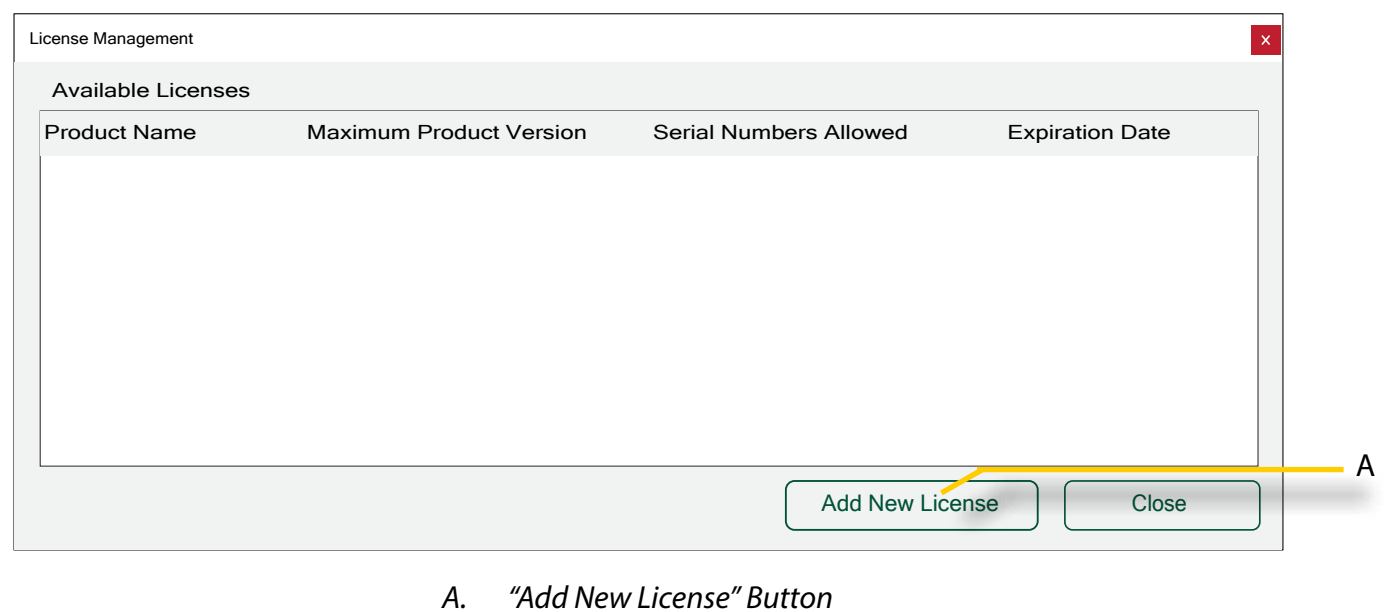
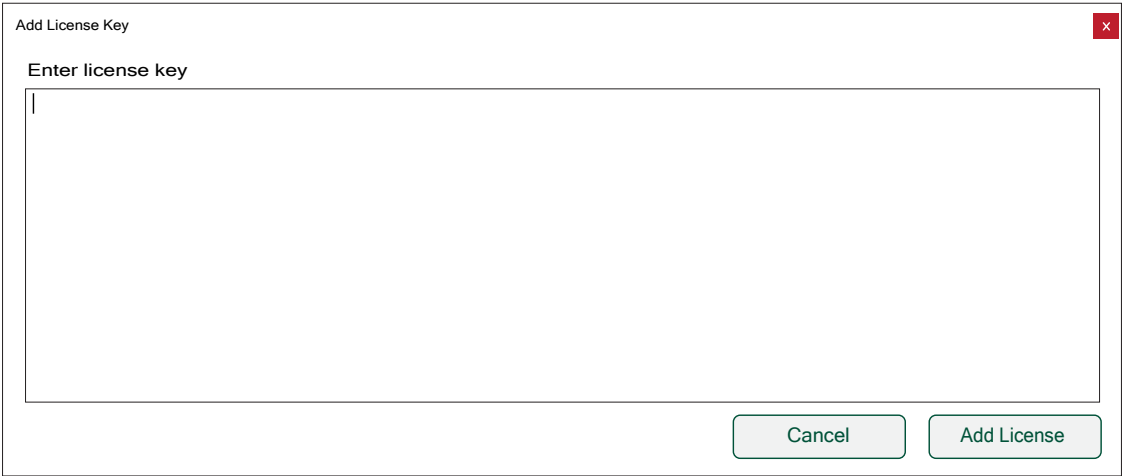


Figure 54 License Management Screen



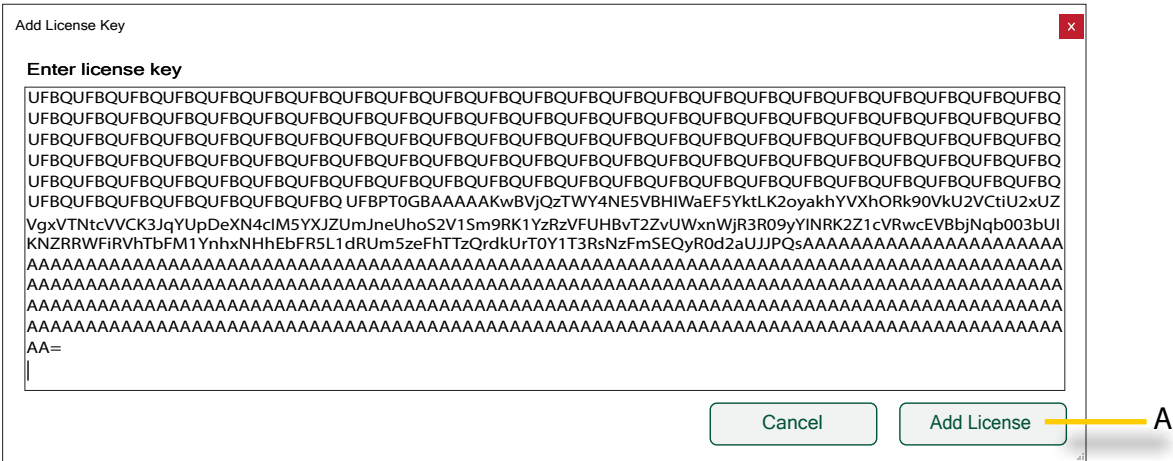
5. In the “License Management” screen, click the “Add New License” button (Figure 54, A) in the lower right corner, opening the “Add License Key” screen shown in Figure 55.

Figure 55 Add License Key Screen



6. Copy the entire license key data printed on the email page and paste the data into the “Enter License Key” text box within the “Add License Key” screen as shown in Figure 56. Press the “Add License” button (Figure 56, A) in the lower right corner of the screen to enter the data into the BreakerView™ Desktop program.

Figure 56 Enter License Key into Add License Key Screen



A. “Add License” Button

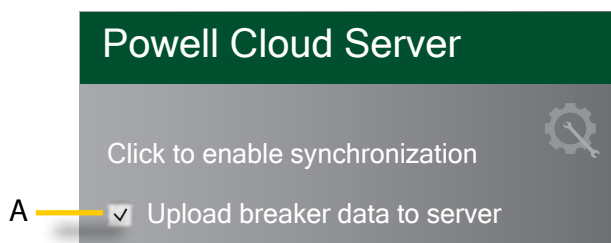
7. After completing the license key installation, all of the circuit breakers and CBMs listed in the Powell entered SO Equipment List data set will be registered and visible in the BreakerView Desktop and BreakerView Web equipment screen page fields.

If additional assistance is needed with BreakerView log-in or breaker registration, please visit powellind.com or call 1.800.480.7273.

Ch 5 Report Generation and Viewing

Establish a connection to the internet and open the BreakerView™ desktop application. Click the “Upload breaker data to server” check box ([Figure 57, A](#)) on the lower left hand side of the screen to synchronize data into the Cloud server.

Figure 57 Upload Breaker Data to Server

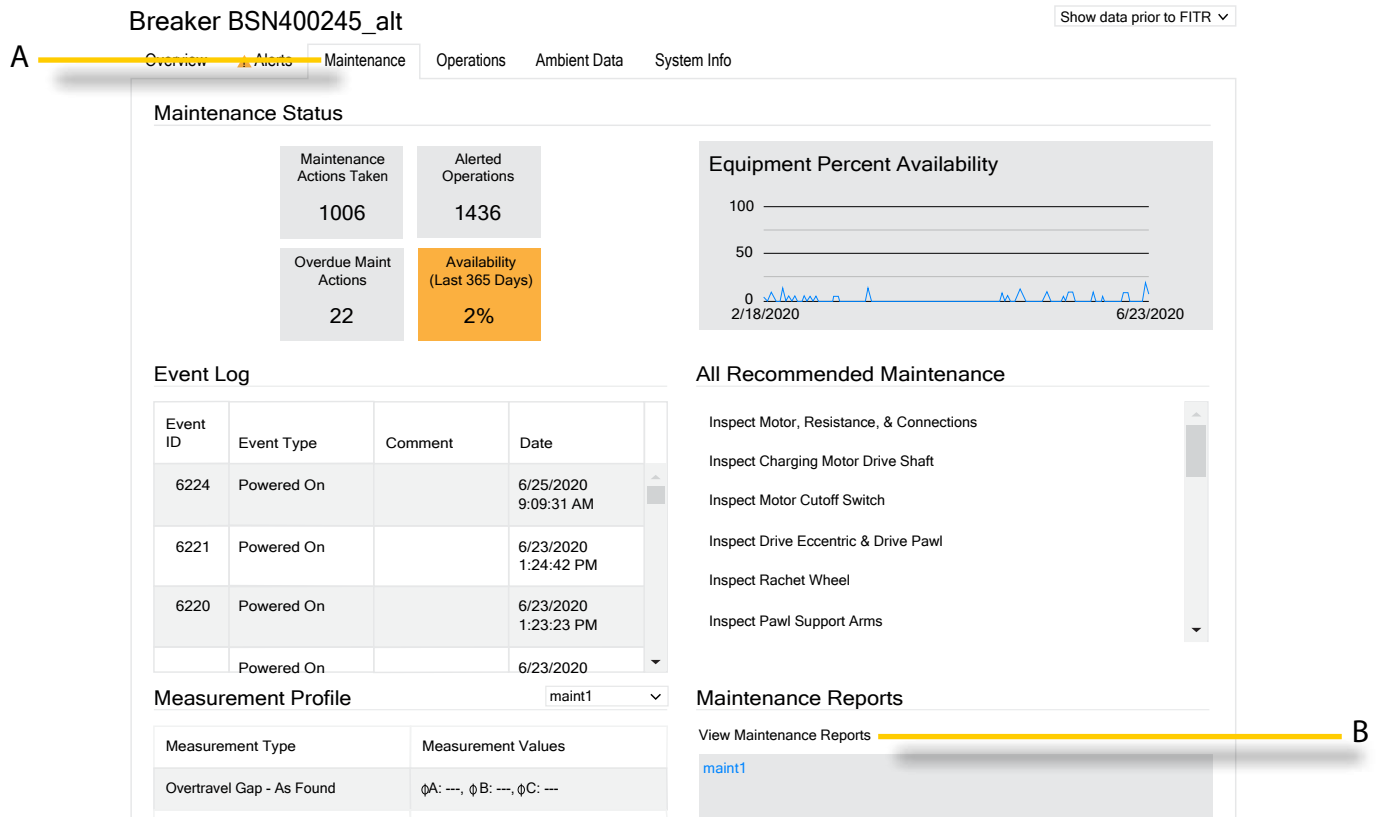


A. Click to Upload Breaker Data to Server

A. BREAKERVIEW™ WEB

Reports of completed maintenance from the Cloud Data Server are viewed by performing the following steps:

1. Using a web browser, log into the BreakerView Web account. Select the "Equipment" button to list all CBM equipped circuit breakers associated with your account. Click on the circuit breaker of interest.
2. Click on the “Maintenance” tab ([Figure 58, A](#)) along the horizontal menu under the breaker serial number.
3. In the lower right hand corner, the “View Maintenance Reports” ([Figure 58, B](#)) section will show all maintenance reports from the breaker that have been submitted and uploaded to the server. To open one of the reports, click on the report title.
4. This will display the maintenance report in a new tab in the user’s web browser.
5. Open the settings and customization menu in the web browser and select “Print” to bring up the print screen for the maintenance report. Alternatively, the user can press Ctrl+P to access the same screen. Here, the user can print a report if connected to a printer.

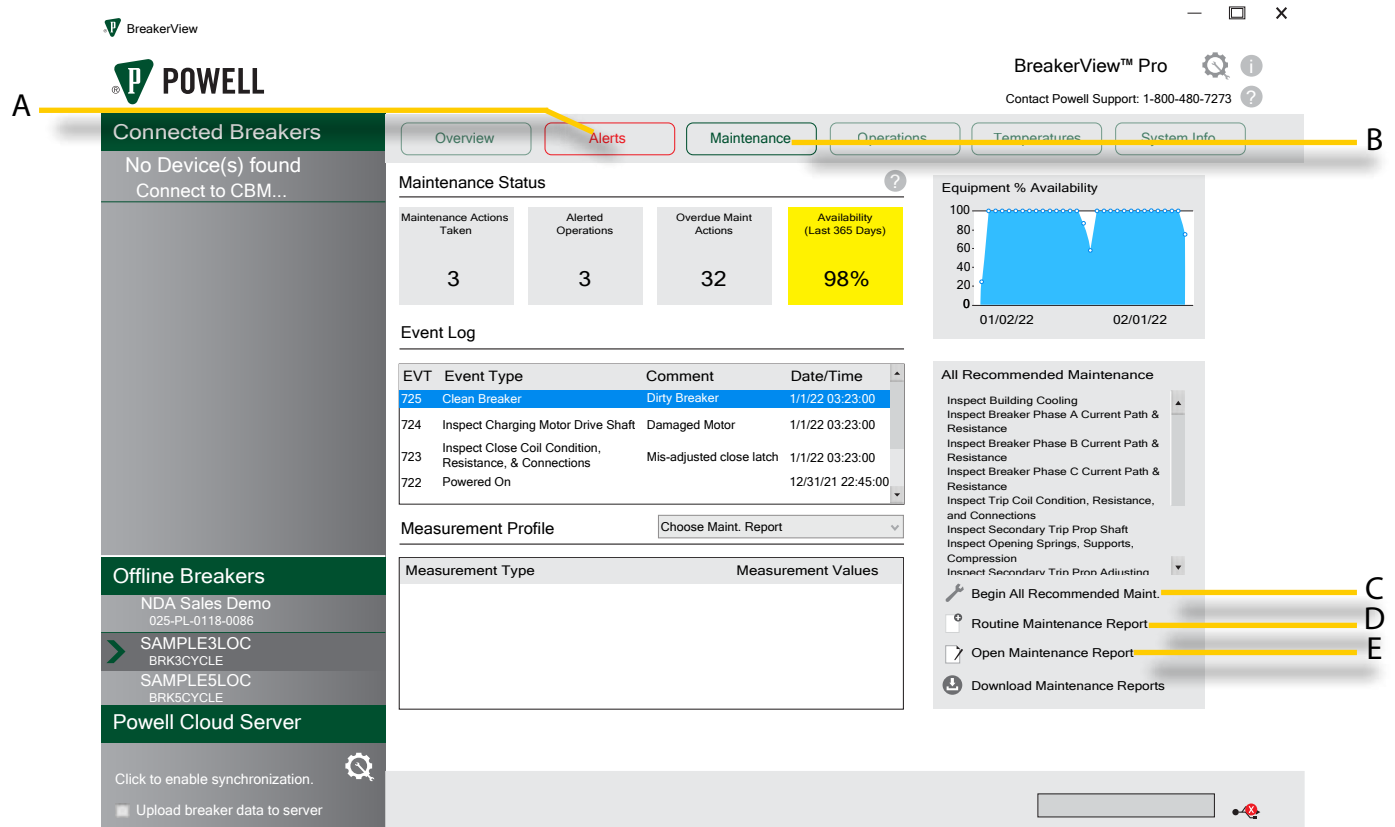
Figure 58 BreakerView™ Web Maintenance Screen

- A. "Maintenance" Tab
- B. "View Maintenance Reports" Section

B. BREAKERVIEW™ DESKTOP

1. Open the BreakerView™ application and select the circuit breaker of interest.
2. Click on the Maintenance tab (Figure 59, B) at the top menu in the BreakerView desktop application.
3. If there are already reports on the breaker, the user may proceed to step 4. If not, the user can create or download maintenance reports. Maintenance reports can be created from the "Begin All Recommended Maint." (Figure 59, C) or the "Routine Maintenance Report" (Figure 59, D) buttons on the Maintenance tab, or from clicking the wrench icons on the Alerts tab (Figure 62, A).
 - a. Selecting any of the above options will open a form asking for a report name (Figure 60).
 - b. Entering a name and selecting "OK" will create a report (Figure 61).

Figure 59 BreakerView™ Desktop Maintenance Screen



- A. "Alerts" Tab
- B. "Maintenance" Tab
- C. "Begin All Recommended Maint" Link
- D. "Routine Maintenance Report" Link
- E. "Open Maintenance Report" Link

Figure 60 Maintenance Report Name

Report Name

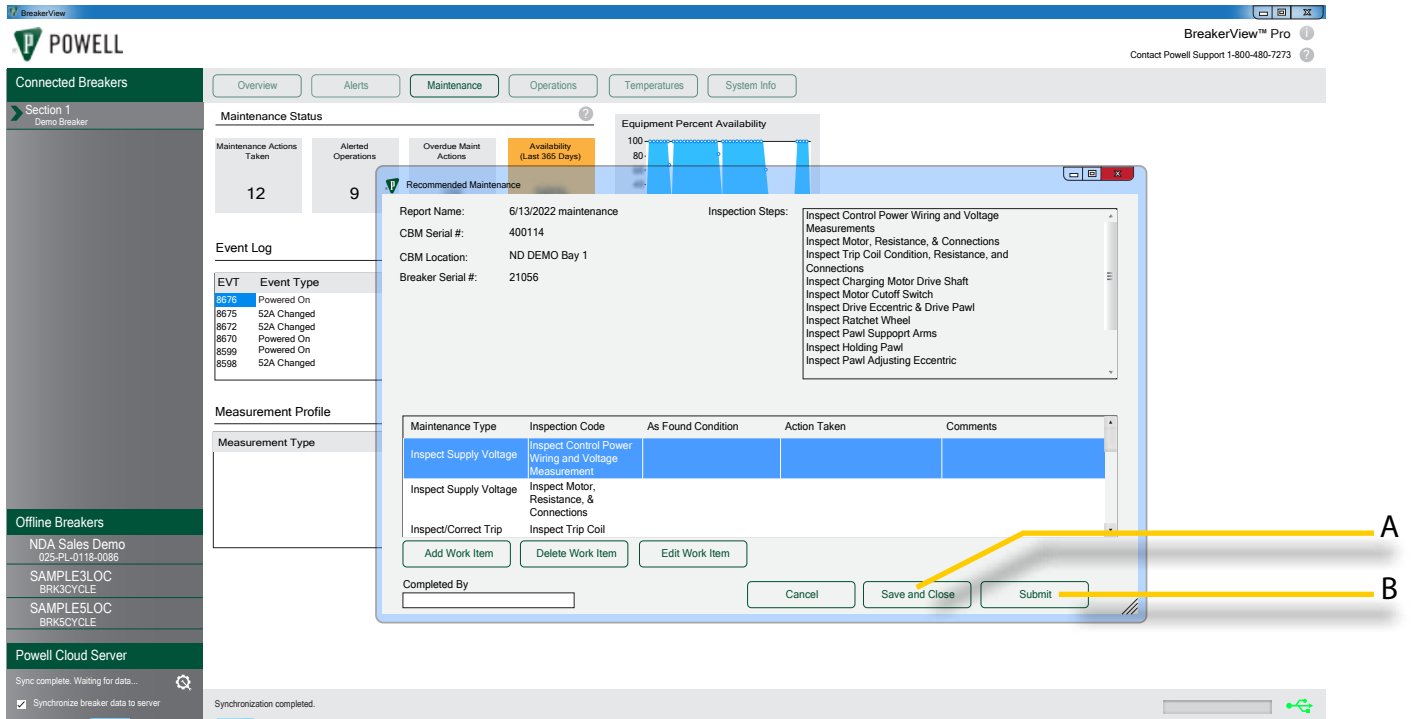
Enter Report Name

Report 1

Cancel OK

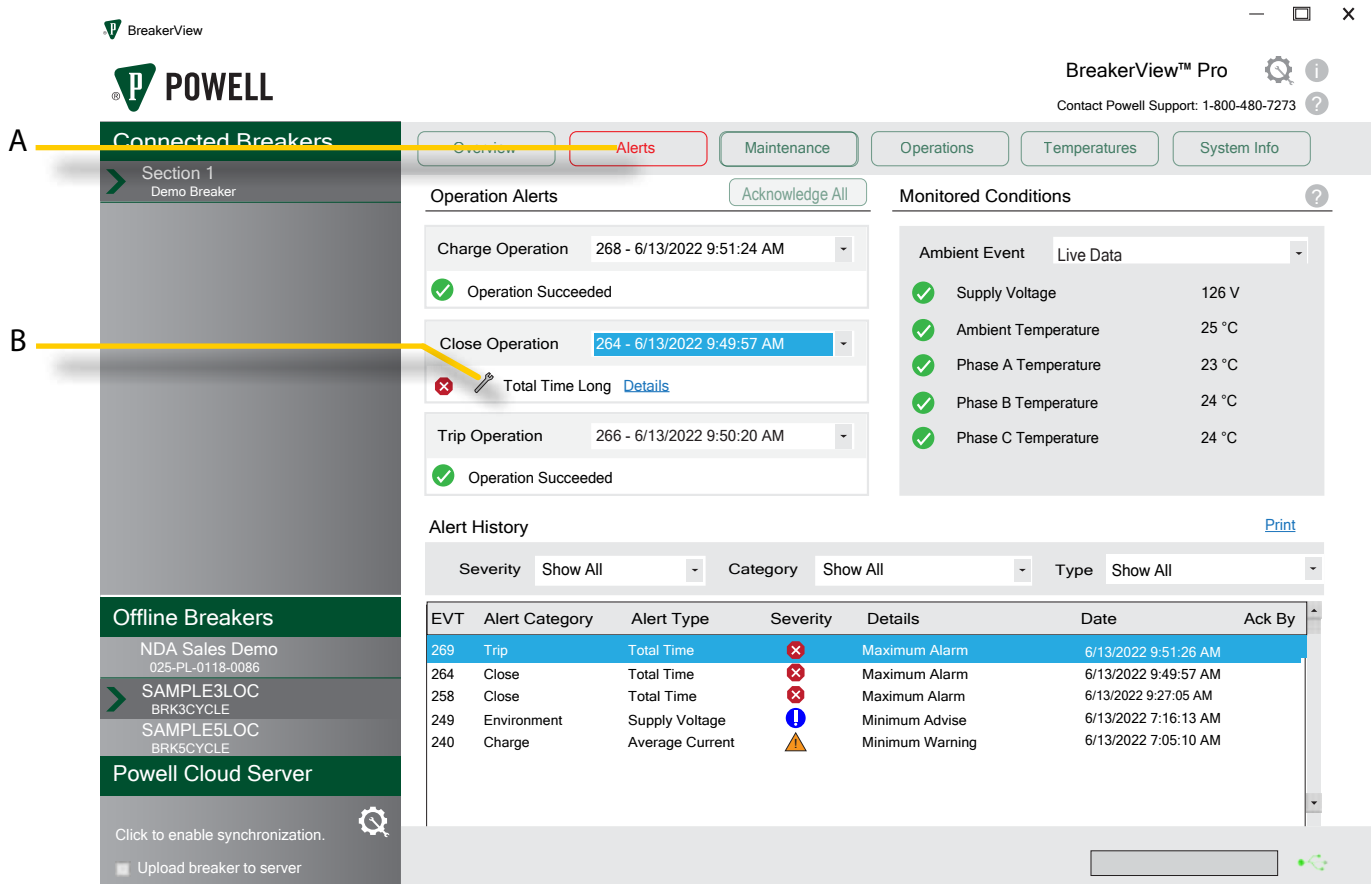
- c. To save the report, the user may select “Save and Close” (Figure 61, A). This will allow the report to be edited on reopening.
- d. To submit the report, the user may select “Submit” (Figure 61, B). This will NOT allow the report to be edited on reopening.

Figure 61 BreakerView™ Recommended Maintenance



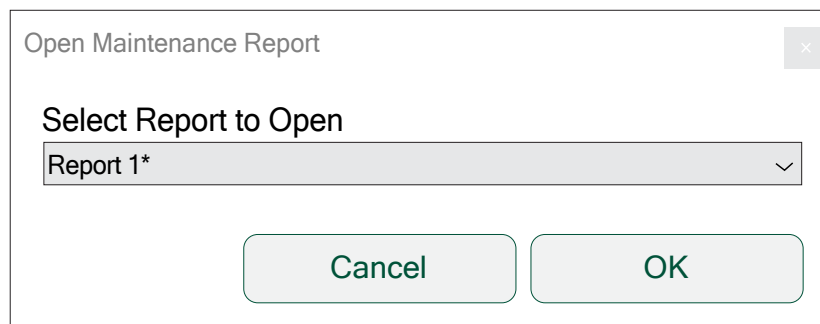
A. “Save and Close” Button

B. “Submit” Button

Figure 62 BreakerView™ Desktop Alert Screen

- A. "Alerts" Tab
B. "Wrench" Icon

4. Click on "Open Maintenance Report" (Figure 59, E) in the lower right hand corner of the application screen.
5. Select a report from the drop-down menu and click "OK" to open the report (Figure 63).

Figure 63 BreakerView™ Open Maintenance Report

6. If the report has been previously submitted, the user will not be able to edit the report. If the report has NOT been submitted, the user can change the report as is necessary.

- 7. Once the report is ready to be printed, click on the “Print Preview” button (Figure 64, B) in the lower left hand corner of the Maintenance Report screen. This will display the maintenance report in the user’s web browser.

Figure 64 BreakerView™ Maintenance Report

Maintenance Report

Report Name Report 1
Breaker Serial BRK3CYCLE CBM Serial 499999 Location SAMPLE3LOC

Customer Info

As Received

Maint. Checks

Breaker Tests

Work Perf.

Customer Information

Customer

Sample Customer

Page

1

Address

Sample Address

Job #

1

User

Sample User

Asset ID

1

Plant Location

Sample Location

Ambient Temp (°F)

95

Substation

Sample Substation

Humidity (%)

100

Equipment ID

Sample ID

Device ID

1

Project Information

Powell Project #

1

Project Type

☒ Maintenance

Customer P.O.

1

☐ Repair

Wiring Diagram #

1

☐ DD Mechanism

Rating Upgrade (MVA/kA)

1

☐ Other

B

Print Preview

Cancel

Save and Close

Submit

C

- A. “Save and Close” Button
- B. “Print Preview” Button
- C. “Submit” Button

- 8. Open the settings and customization menu in the web browser, and select “Print” to bring up the print screen for the maintenance report. Alternatively, the user can press Ctrl+P to access the same screen. Here, the user can print a maintenance report if connected to a printer.

Ch 6 Database Backup and Restore

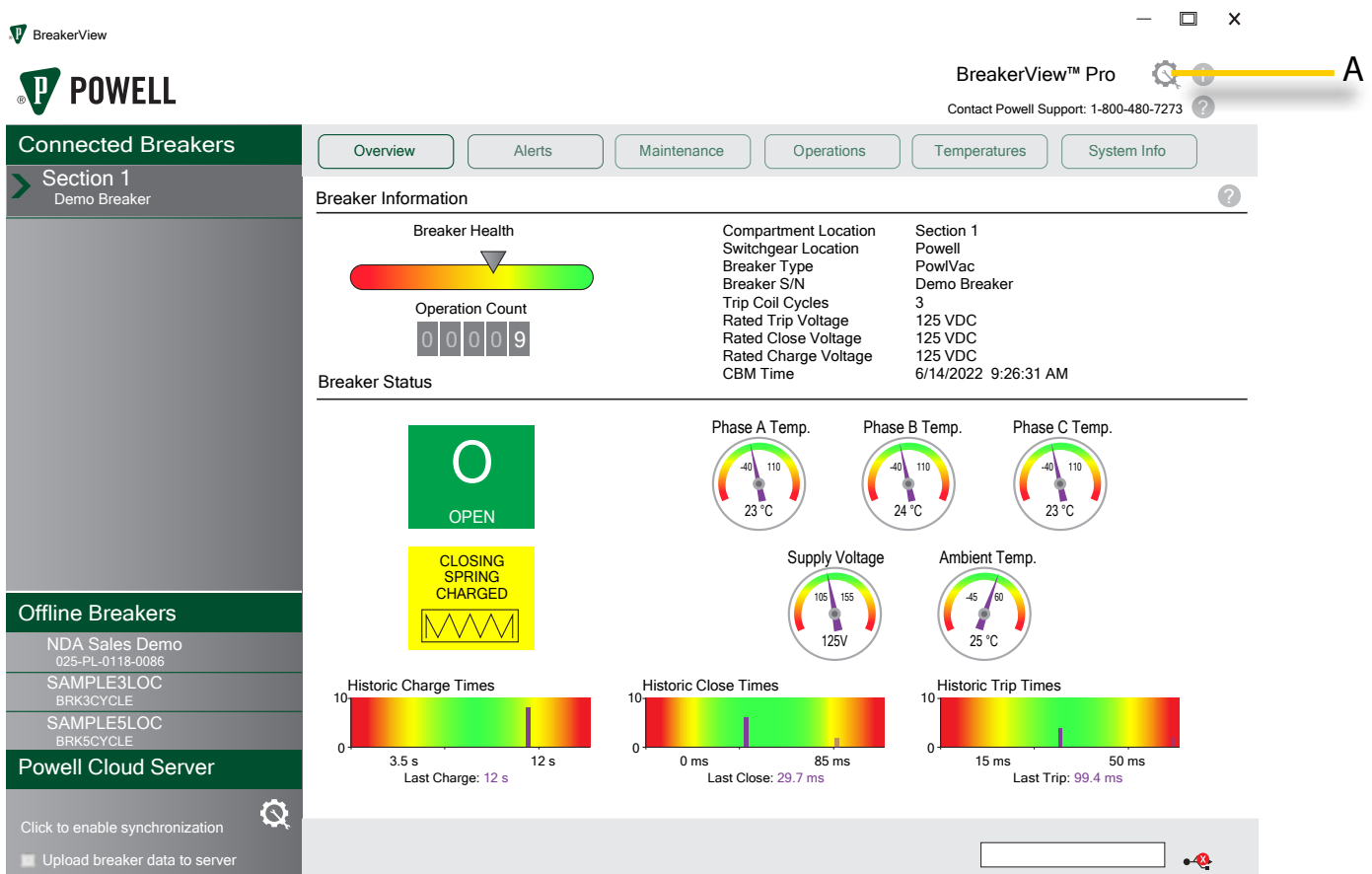
BreakerView™ has the functionality to backup and restore its database into a USB removable media.

A. SETTING UP USB REMOVABLE MEDIA

The USB removable media is used to export or import data from a device running BreakerView. It must be setup with the valid file structure and transfer license to enable database transfers.

1. Open the BreakerView application. Click the “Setting” icon in the upper right corner of the screen (Figure 65, A).

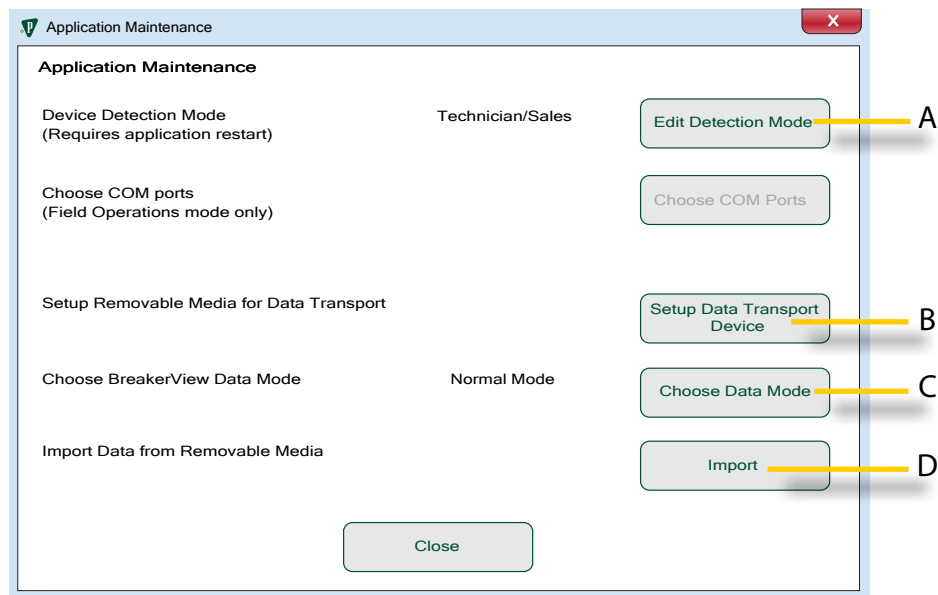
Figure 65 BreakerView™ Overview Screen



A. “Setting” Icon

2. In the “Application Maintenance” screen, select the “Setup Data Transport Device” (Figure 66, B).

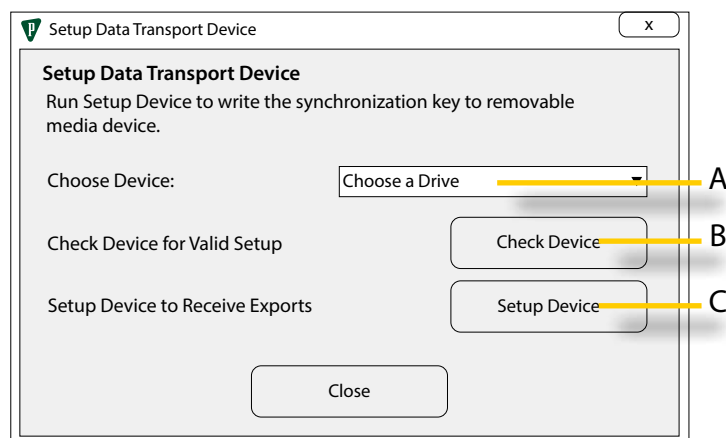
Figure 66 Application Maintenance Screen



- A. Edit Detection Mode
- B. Setup Data Transport Mode
- C. Choose Data Mode
- D. Import

3. Choose the drive to be setup (Figure 67, A).

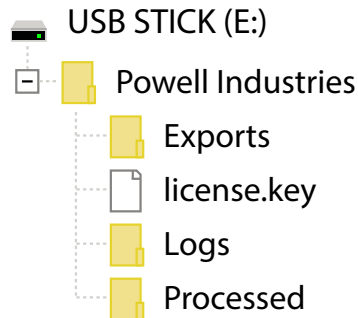
Figure 67 Setup Data Transport Device



- A. Choose Device
- B. Check Device for Valid Setup
- C. Setup Device

4. Select "Check Device" ([Figure 67, B](#)) to verify if the device has a valid file structure and transfer license.
5. Select "Setup Device" ([Figure 67, C](#)) to create valid file structure ([Figure 68](#)) and transfer license to allow export of data.

Figure 68 USB Export Folders



- a. Folders description referring to [Figure 68](#).
 - Powell Industries
 - Exports - holds the exported databases
 - license.key - transfer license valid for 90 days and must be recreated in BreakerView™ after 90 days
 - Logs - log files for troubleshooting and diagnostics
 - Processed - databases will be moved here once it is imported back into BreakerView™

B. AUTOMATIC EXPORT MODE

1. Open the BreakerView application. Click the "Setting" icon in the upper right corner of the screen ([Figure 65, A](#)).
2. In the "Application Maintenance" screen select the "Choose Data Mode" ([Figure 66, C](#)).
3. Select "Automatic Export Mode" ([Figure 8](#)). Then close the "Application Maintenance" screen.
4. Insert a valid USB removable device to start the export. If using a Dell Edge Gateway device, observe the Cloud LED, if it is exporting, the LED will flash at 5 Hz.
5. If the export is finished, a popup window will indicate that the export is finished. If using a Dell Edge Gateway Device, the Cloud LED will be at steady ON state.

Table B Dell Edge Gateway Cloud LED States

Removable Device State	Operation	Cloud LED State
Connected	No Operation/Finished	ON
Connected	Exporting	Flashing at 5 Hz
Connected	Error	Flashing at 1 Hz (with 30s timeout)
Disconnected	Device disconnected coming from any state	OFF (If from error, it will continue to flash 1 Hz until timeout)

C. NORMAL MODE

1. Open the BreakerView™ application. Click the "Setting" icon in the upper right corner of the screen (*Figure 65, A*).
2. In the "Application Maintenance" screen select the "Choose Data Mode" (*Figure 66, C*).
3. Select "Normal Mode" (*Figure 8*). Then close the "Application Maintenance" screen.
4. Insert the USB media device into the PC.
5. Go to the "Application Maintenance" screen, then choose "Import" (*Figure 66, D*).
6. Choose from either the "merge" or "replace" options. "Replace" will import the new data as the only data in the local database. "Merge" will combine the existing data with the new data.
7. Navigate to copy of database to be merged or loaded:
 - if the source file is a local database backup, the directory should be automatically selected when the file selection dialogue opens - it is typically "C:\Program Files (x86)\Powell Industries\BreakerView\BreakerView 3.6\Backup"
 - if the source is from a USB device, the directory for these is typically "X:\Powell Industries\Exports" where "X" is the drive letter of the USB device
8. Select the desired database for import. The file name will be built from the computer name, "Manual" or "Automatic", and the time of the file creation. The extension of the file will be ".Bak".
9. As the import proceeds, a message box detailing the automatic backup of the current local database will be displayed. This feature allows regression to the pre-import database should this be desired. Click "Ok" to proceed once this is complete. Do not close and restart the application at this time.
10. The selected database will then be imported or merged according to the prior selection.
11. A message box detailing that the database has been synced will be displayed. Click "Ok" to proceed.
12. Close "Import" options dialog box.
13. Close "Application Maintenance" menu.
14. Close and restart the BreakerView application to load the new database.

Ch 7 BreakerView™ Tools

A. FIRMWARE UPGRADE

BreakerView™ has the functionality to upgrade CBM and IRIM hardware to the latest version of firmware and change the CBM "Limits" version to the latest.

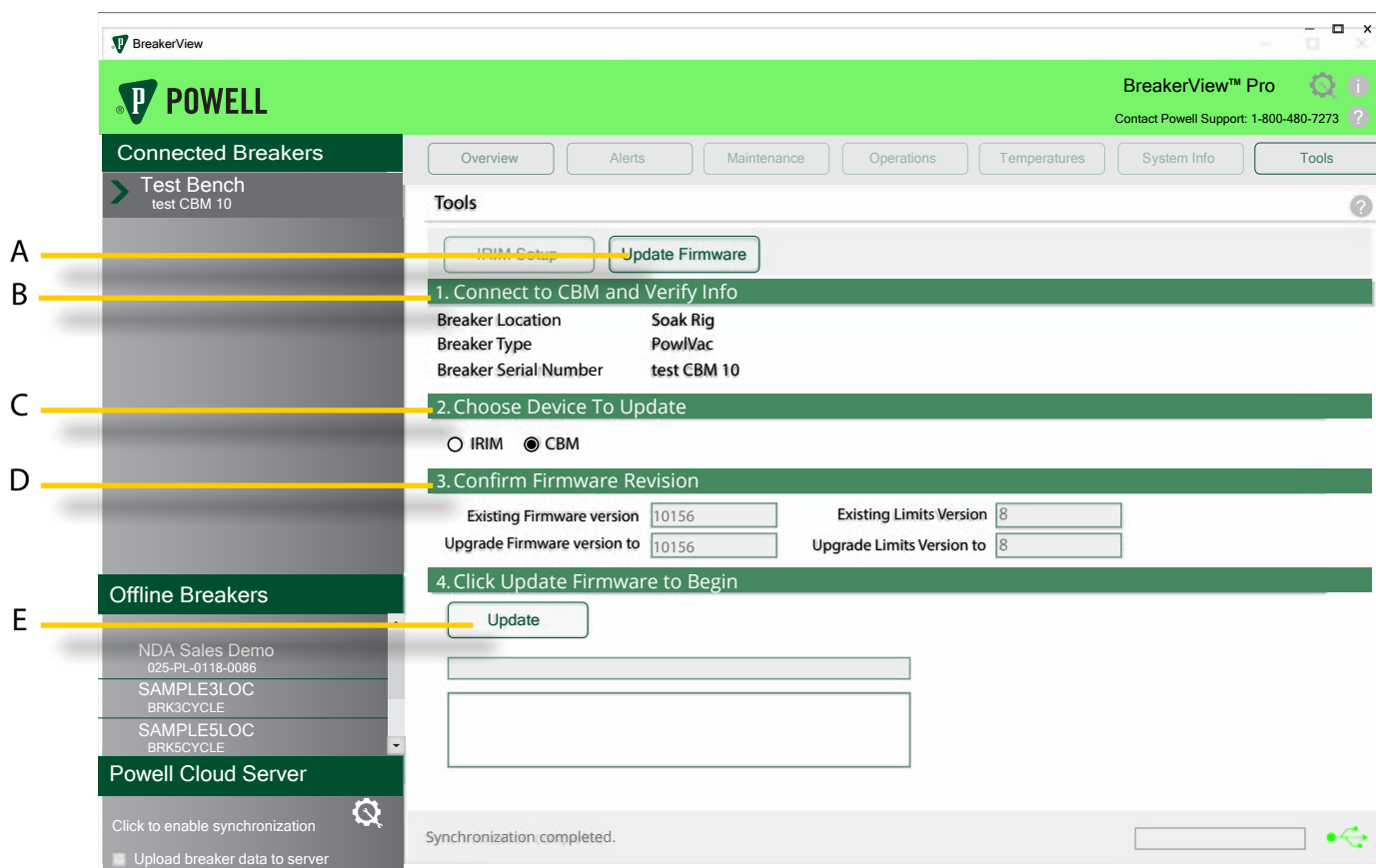
1) Updating the CBM

- a. Open the BreakerView application and select the "Tools" tab (Figure 69, A).

Figure 69 BreakerView™ Overview Screen with Tools Tab Selected



A. "Tools" Tab

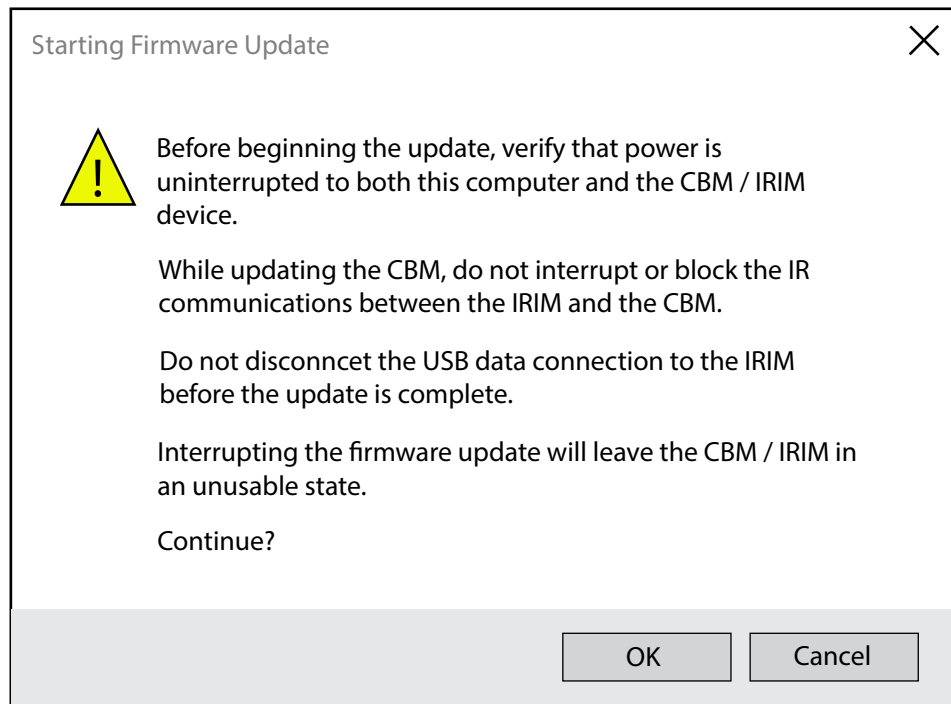
Figure 70 BreakerView™ Update Firmware Screen with CBM Selected

- A. "Update Firmware" Button
- B. Verify Information Section
- C. Device Selection Section
- D. Confirm Firmware Section
- E. "Update" Button

- b. Select "Update Firmware" (Figure 70, A).
- c. Verify the information of the breaker to be upgraded (Figure 70, B).
- d. Select the CBM as the device to be updated (Figure 70, C).
- e. Verify the existing firmware version and existing limits version (Figure 70, D) and upgrade firmware version if it is the intended target version.
- f. Click the "Update" button (Figure 70, D). This will start the upgrade process and follow the on-screen instructions.

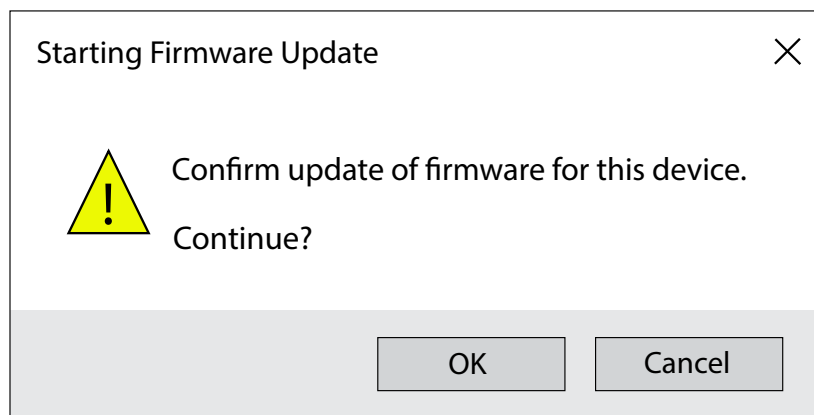
- g. Confirm the Starting Firmware Update warning ([Figure 71](#)). If all items are satisfied, click "Ok".

Figure 71 Starting Firmware Update Warning Screen



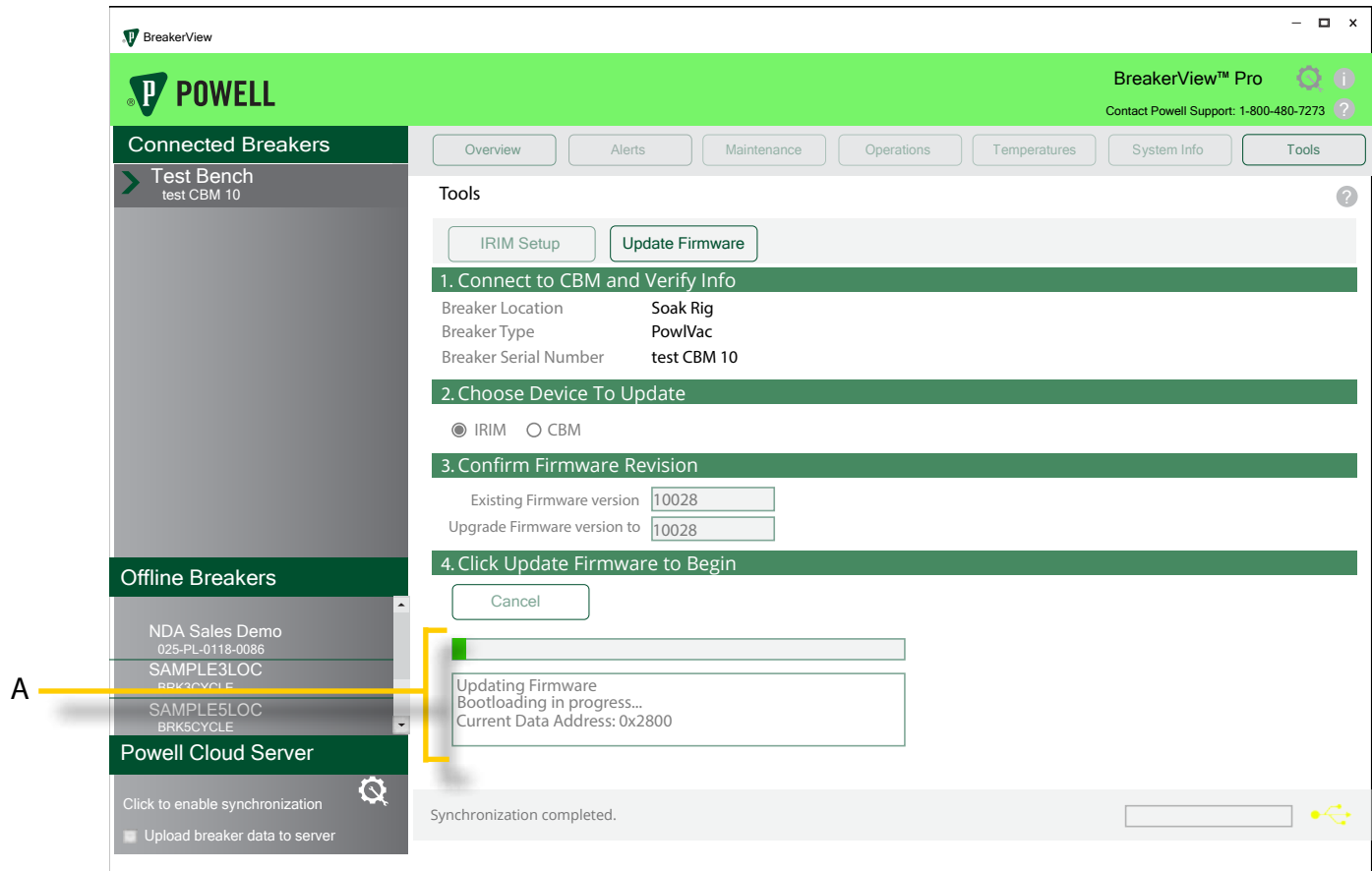
- h. Confirm update of the selected device, click "Ok" to continue ([Figure 72](#)).

Figure 72 Device Confirmation Warning



- i. After confirming the warning messages, the update will start (Figure 73, A).

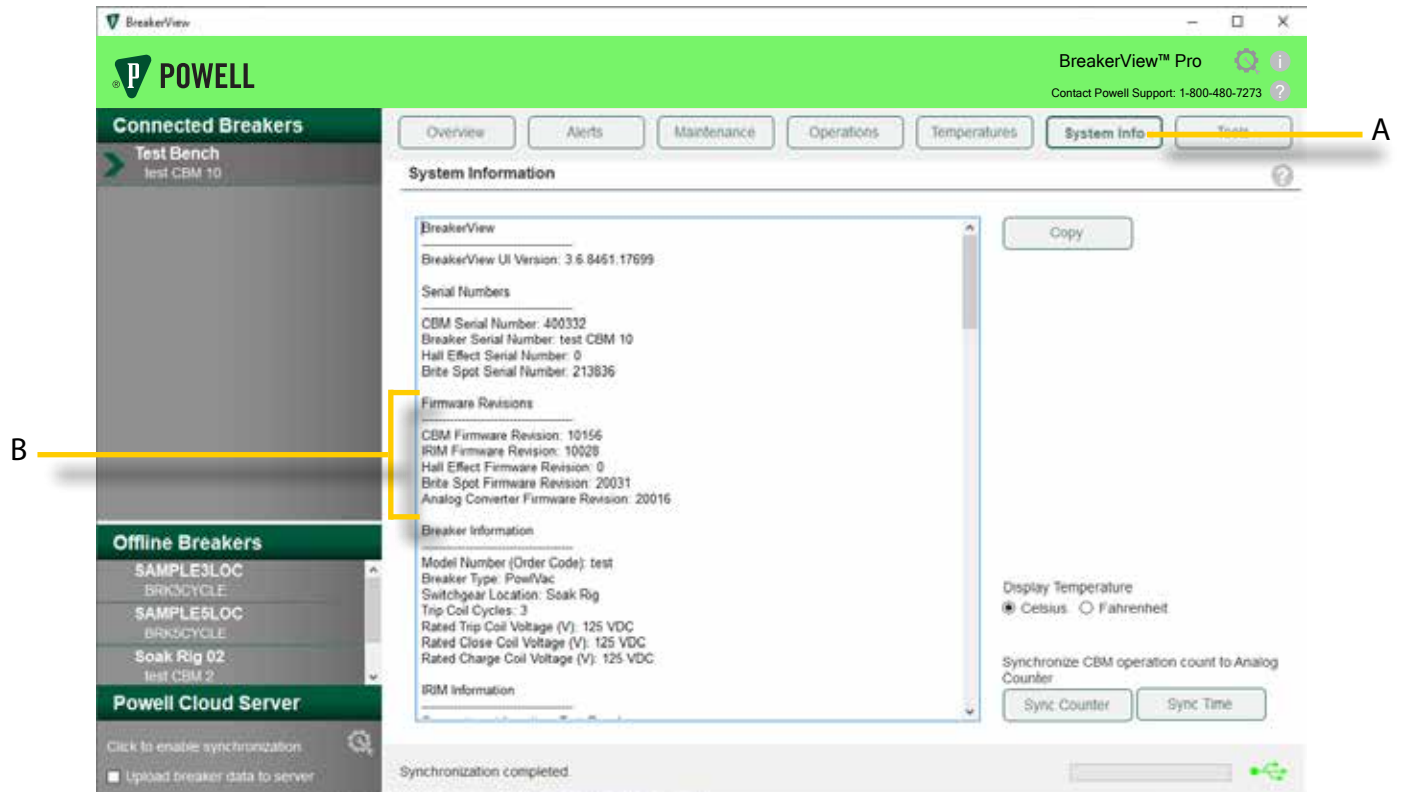
Figure 73 Update in Progress Screen



A. Update in Progress Section

- j. Once the upgrade is completed, restart the BreakerView™ application.
- k. Open the BreakerView application and verify the latest firmware version under the "System Info" tab in the Firmware Revisions section (*Figure 74, B*).

Figure 74 System Info Screen

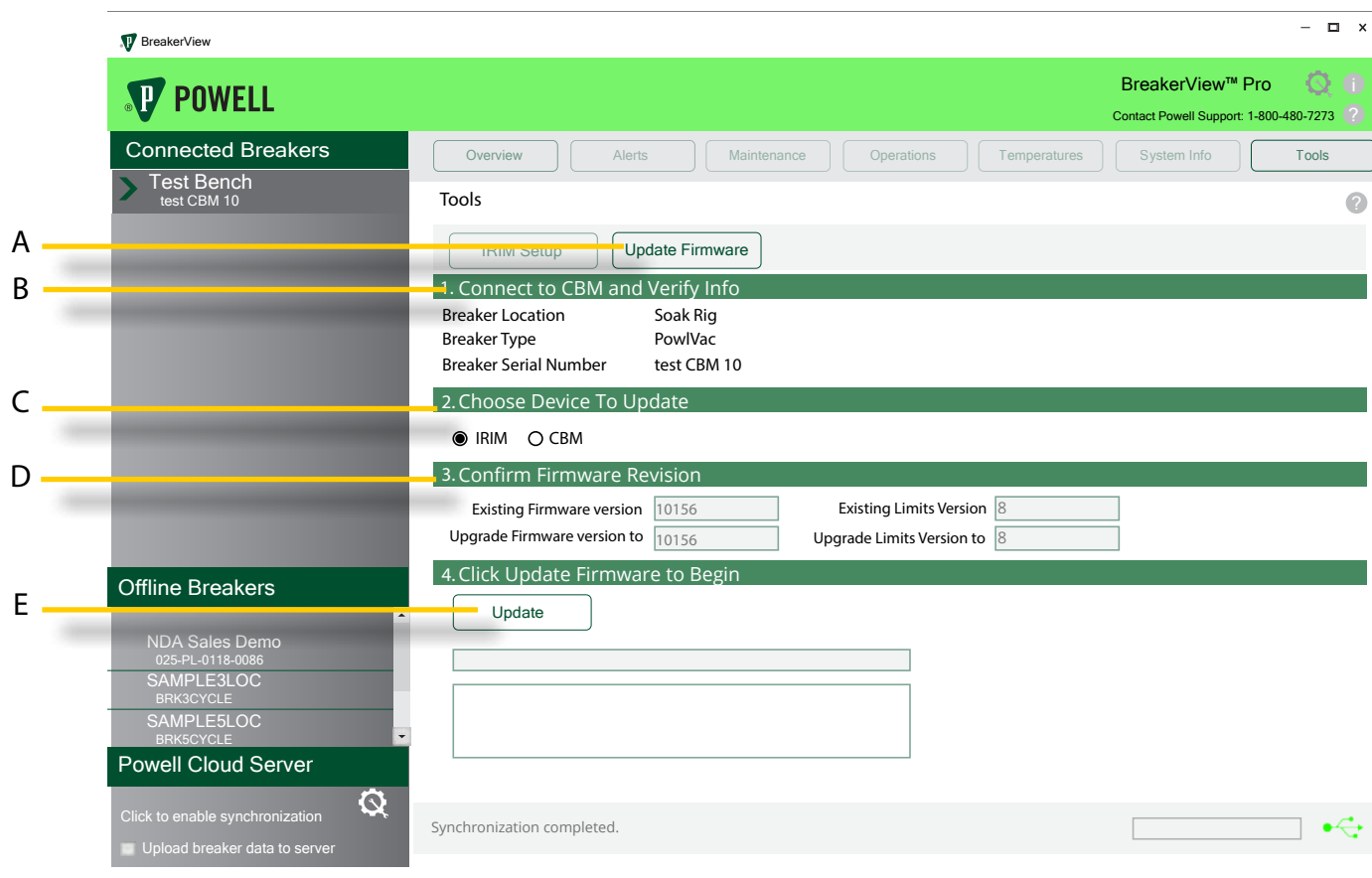


- A. "System Info" Tab
- B. Firmware Revisions Section

2) Updating the IRIM

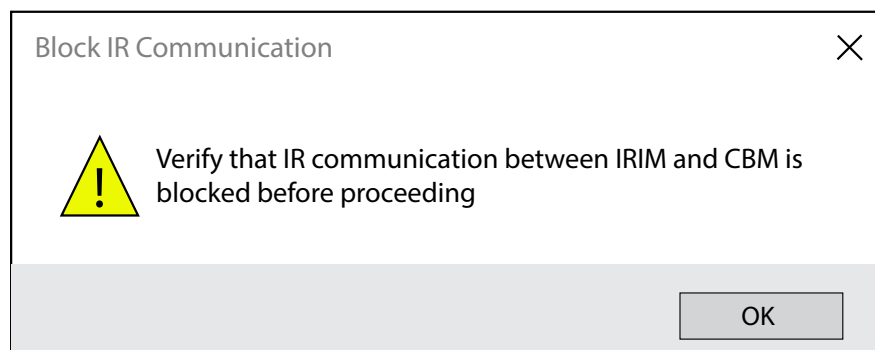
- a. Open the BreakerView™ application and select the "Tools" tab (Figure 69, A).

Figure 75 BreakerView™ Update Firmware Screen with IRIM Selected



- A. "Update Firmware" Button
- B. Verify Information Section
- C. Device Selection Section
- D. Confirm Firmware Section
- E. "Update" Button

- b. Select "Update Firmware" (Figure 75, A).
- c. Verify the information of the breaker to be upgraded (Figure 75, B).
- d. Select the IRIM as the device to be updated (Figure 75, C).
- e. Verify the existing firmware version and existing limits version (Figure 75, D) and upgrade firmware version if it is the intended target version.
- f. Click the "Update" button (Figure 75, E). This will start the upgrade process and follow the on-screen instructions.
- g. Confirm the Starting Firmware Update warning (Figure 71). If all items are satisfied, click "Ok".
- h. Confirm the update of firmware of the selected device, click "Ok" to continue (Figure 72).
- i. Confirm that the IR communication between the IRIM and the CBM is blocked, click "Ok" (Figure 76).

Figure 76 *Block IR Communication Warning*

- j. After confirming the warning messages, the update will start.
- k. Once the upgrade is completed, restart the BreakerView™ application.
- l. Open the BreakerView application and verify the latest firmware version under the "System Info" tab in the Firmware Revisions section (*Figure 74, B*).

B. IRIM SETUP

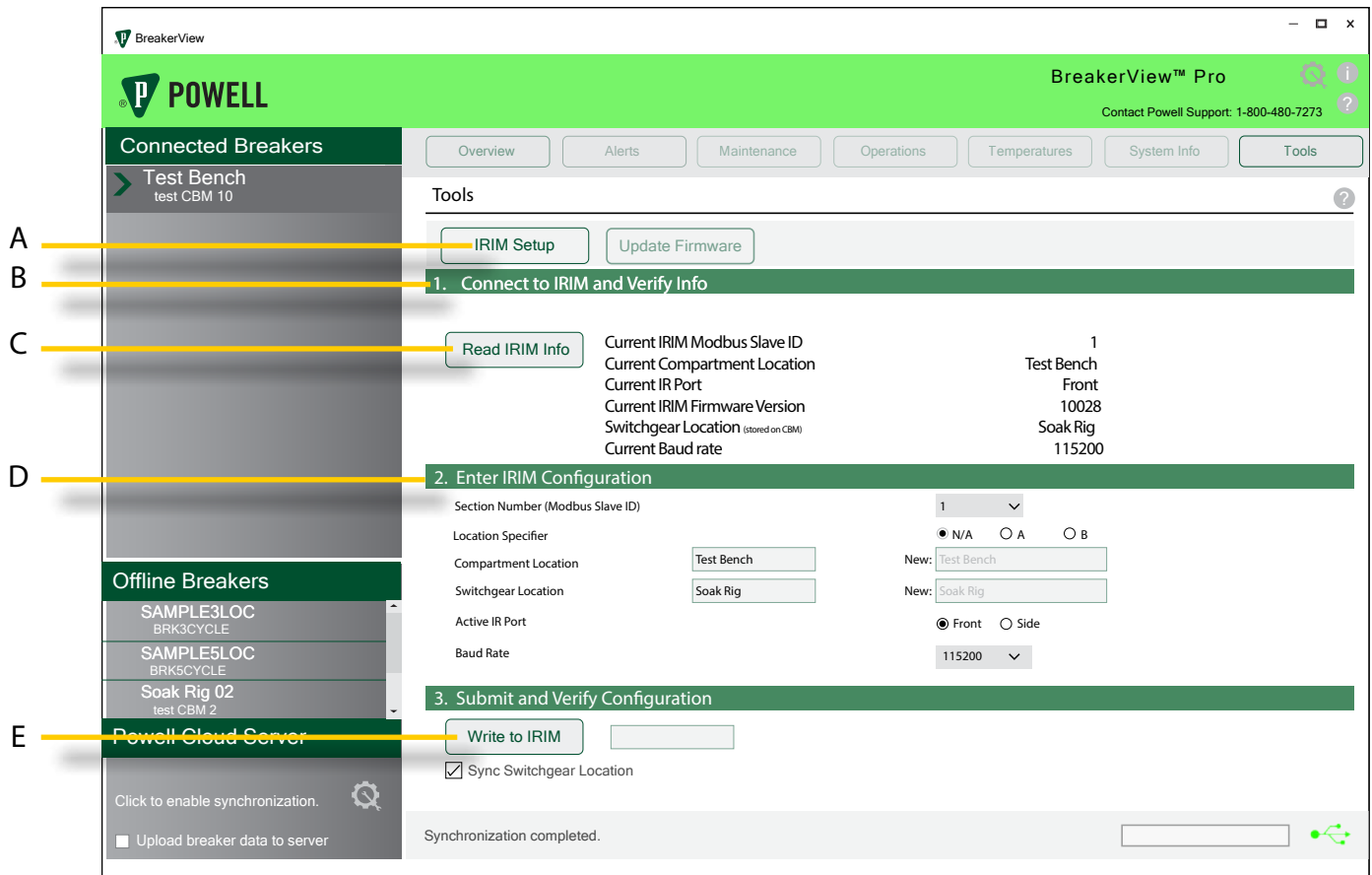
Configuration of the CBM will be done by factory personnel or Powell Service Division personnel.

In order to communicate with the CBM, the IRIM Setup under "Tools" in the BreakerView software will be used. This programs the CBM's Modbus Device ID when a Modbus network is used for CBMs. The user can also select a Location Specifier, and set the Compartment Location, and Switchgear Location, these are inputted by the user manually. The user can also set the Active IR Port used in the CBM Setup and configure the desired Baud Rate for communication. Connecting a computer to the EIM with the associated IRIM communicating to the CBM is required.

To configure the CBM using the IRIM Setup, perform the following steps:

1. Open BreakerView™ application and select the "Tools" tab (Figure 69, A).
2. Select IRIM Setup (Figure 77, A).

Figure 77 BreakerView™ Overview Screen Showing IRIM Setup

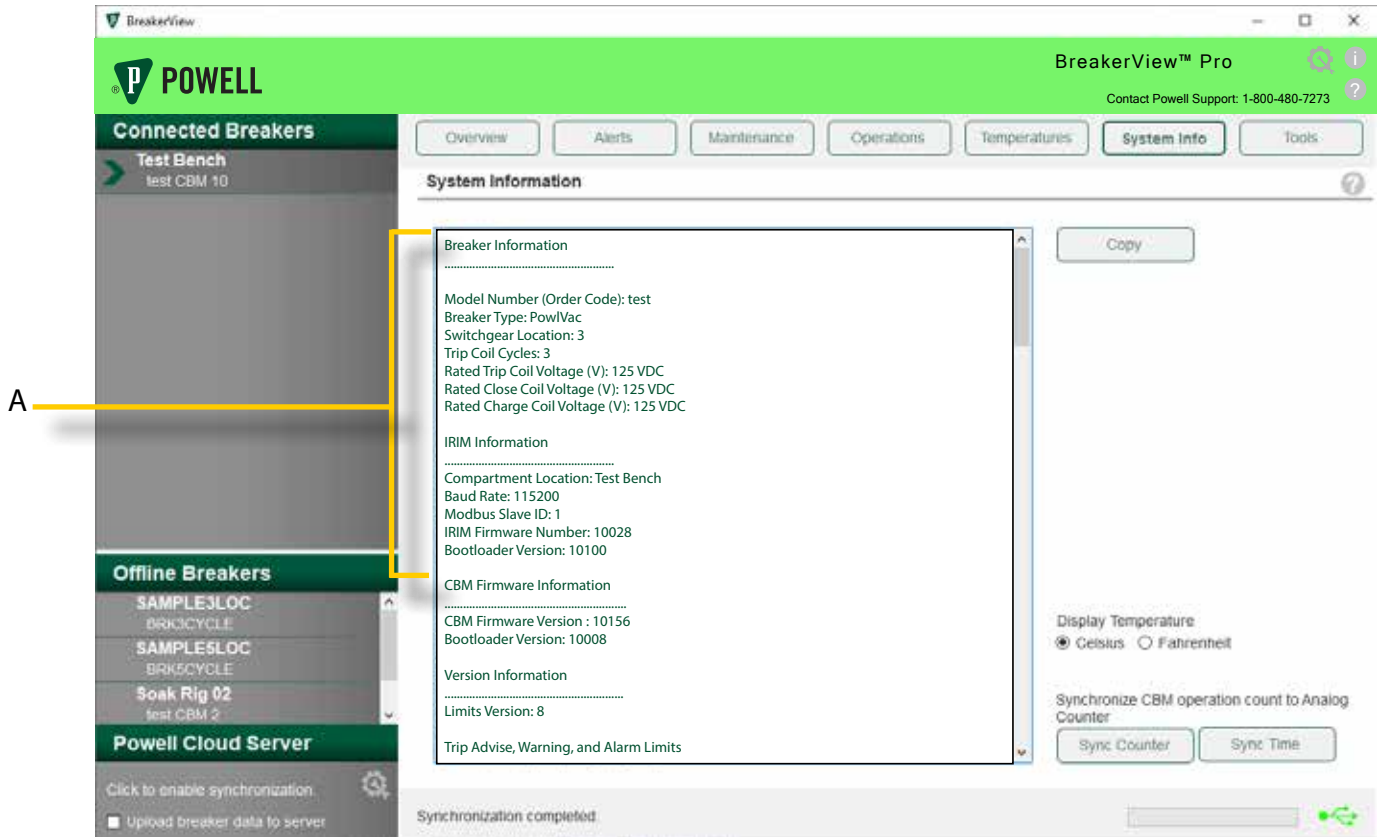


- A. "IRIM Setup" Button
- B. Verify Information Section
- C. "Read IRIM Info" Button
- D. IRIM Configuration Section
- E. "Write to IRIM" Button

3. Click the "Read IRIM Info" button (Figure 77, C) to retrieve the IRIM information from the device.
4. Verify the details after reading the device information (Figure 77, B).
5. In the IRIM Configuration section (Figure 77, D), the user can update the following:
 - Modbus Device ID (Modbus Slave ID)
 - Location Specifier
 - Compartment Location
 - Switchgear Location
 - Active IR Port
 - Baud Rate

- After inputting the desired IRIM configuration, click the "Write to IRIM" button (Figure 77, E). This will save the updated IRIM configuration.
- Once the "Write" is completed, restart the BreakerView application and verify the updated information under the "System Info" tab in the Breaker and IRIM sections (Figure 78, A).

Figure 78 Breaker and IRIM Information Sections



A. Breaker and IRIM Information Section

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BreakerView™ Software User Manual

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