

M-7679 R-PAC QUICK REFERENCE GUIDE

PROTECTION, AUTOMATION AND CONTROL SYSTEM FOR RECLOSER, SWITCH, SECTIONALIZER AND ADVANCED DISTRIBUTION AUTOMATION APPLICATIONS.

Broken Conductor Detection function settings



Required Tools:

- PC running Windows 10® or higher
- S-7600 IPScom Communications Software

Download the latest **IPScom software** at:

<https://beckwithelectric.com/products/s-7600/>

Required Documentation:

- M-7679 Instruction Book
- M-7679 Application Guide
- Communications and Cybersecurity A.G.

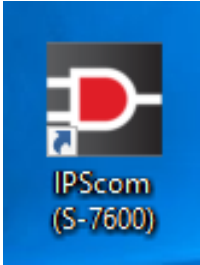
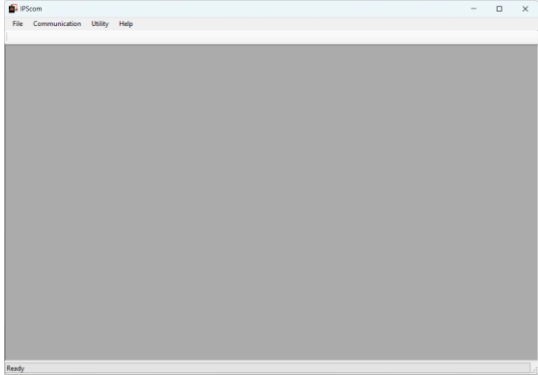
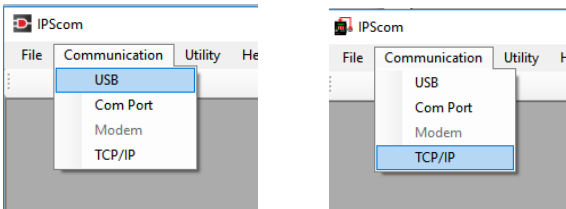
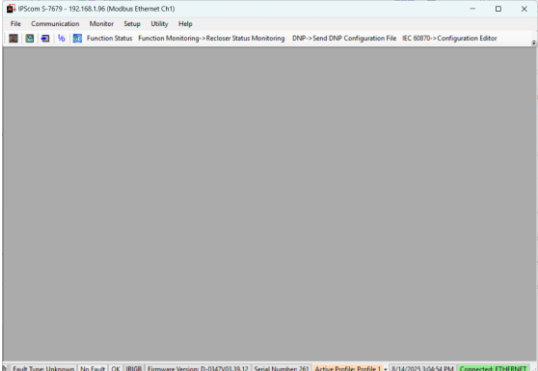
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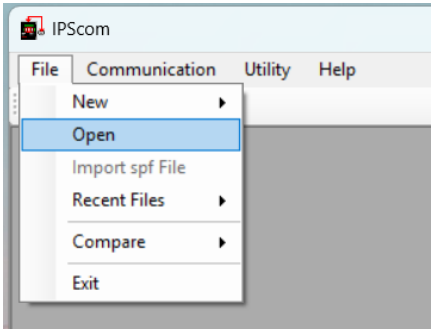
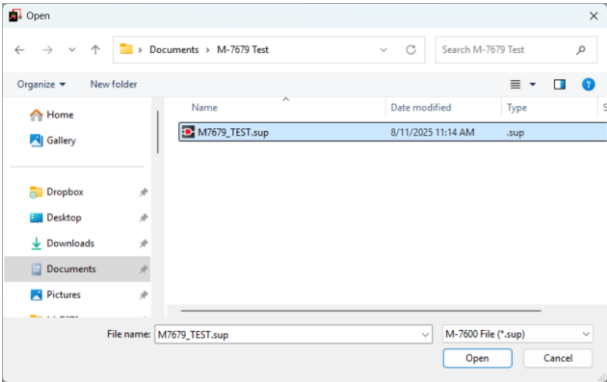
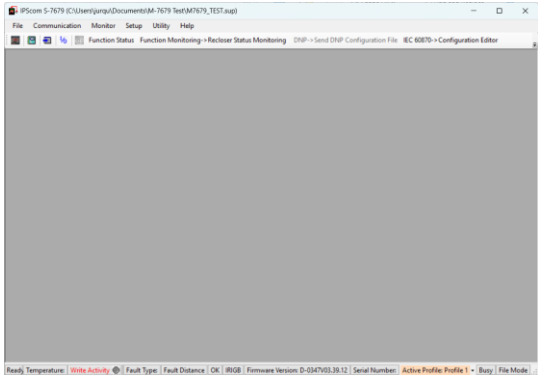
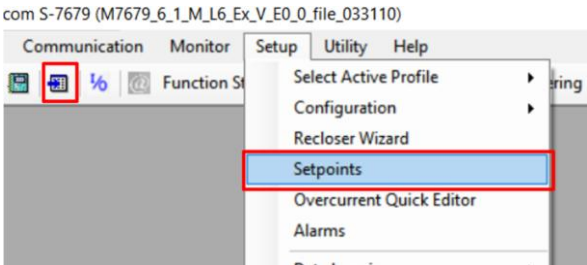
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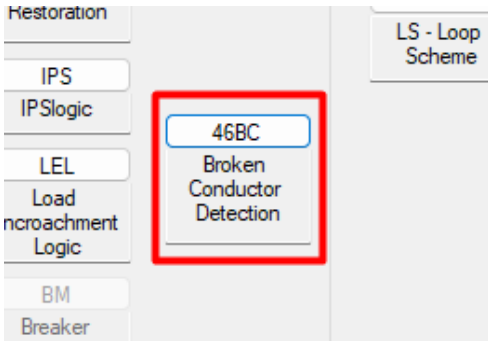
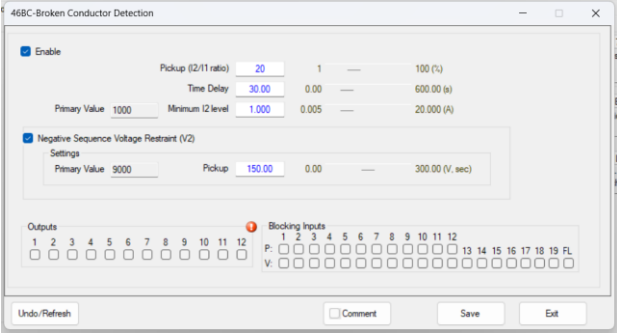
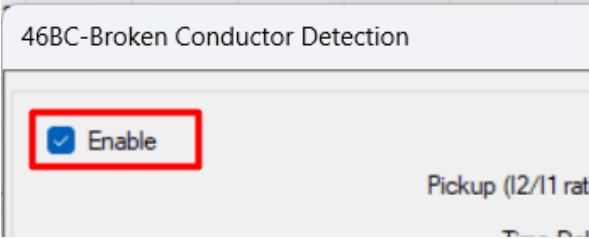
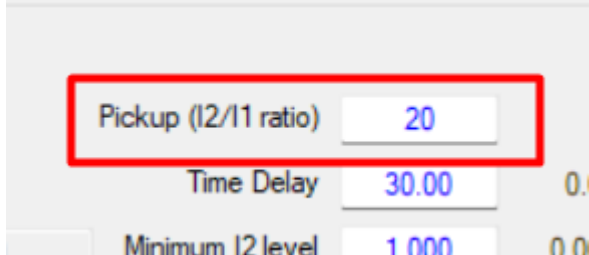
Table of Contents	
Broken Conductor Detection function settings	3

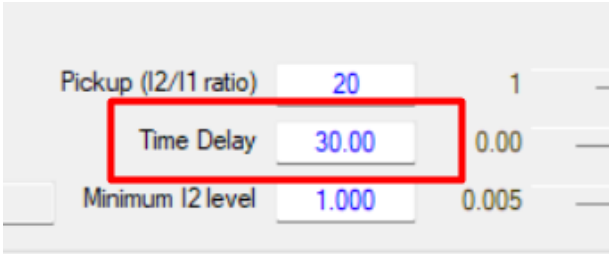
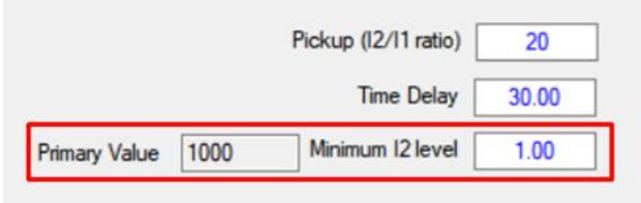
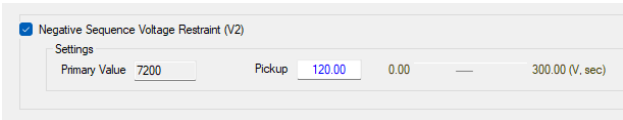
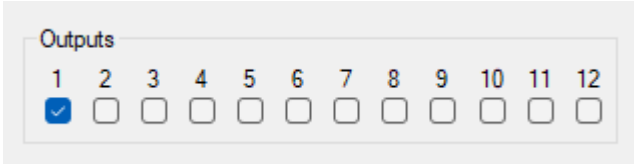
Broken Conductor Detection function settings

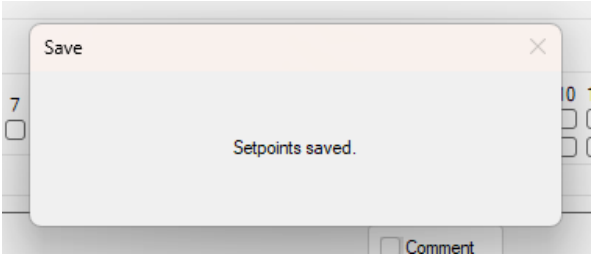
The Broken Conductor Detection (46BC) function provides a reliable method for distinguishing between normal system unbalance and a broken conductor condition. It compares the ratio of Negative Phase Sequence Current (I2) to Positive Phase Sequence Current (I1) against a user-defined percentage threshold. Under normal operating conditions, the I2/I1 ratio remains relatively constant for load variations on a three-phase system. However, when a broken conductor condition occurs, this ratio increases rapidly. This document explains how to program and configure the 46BC function in the M-7679 relay. This feature is available in IPScom version 10.31.03, Firmware version 03.31.02 and newer.

1	Start IPScom Software by double-clicking the corresponding shortcut.	
2	IPScom will display the IPScom Main dialog screen.	
3	If the process will be performed while connected to an M-7679 R-PAC unit, establish a connection to the unit using either USB or TCP/IP mode.	
4	Once the connection is established, IPScom will display the Connected version of the IPScom main screen. Proceed to Step 8.	

5	If the process will be performed without a connection to an M-7679 R-PAC unit, navigate to File > Open to access an existing configuration file.	
6	IPScom will display the Open Dialog screen. Find the required .SUP file and select OPEN .	
7	IPScom will display the Not-Connected version of the main screen.	
8	Go to Setup / Setpoints or select the Setpoints icon in the Tool bar.	

9	IPScom will display the Typical Setpoints screen from which all individual function setting dialog screens can be accessed. Selecting a function setting button will display the corresponding function dialog screen. Up to eight setpoints profiles may be used, select the adequate profile to be set.	
10	From Setpoints screen, select 46BC function button.	
11	IPScom displays the 46BC – Broken Conductor Detection function screen	
12	Make sure the Broken Conductor Detection function is enabled by selecting the Enable checkbox at the top left corner of the window.	
13	The Pickup setting corresponds to the I2/I1 ratio. This setting is given in Percentage value. Example: Pickup = 20% corresponds to a I2/I1 ratio of 0.2.	

14	The Time Delay setting is the time in seconds that the protection function will take to operate (send the trip command). Set the desired Time Delay value in seconds.	
15	The Minimum I2 level setting defines the negative-sequence current threshold. If the measured negative-sequence current (I2) exceeds this setting for a duration longer than the configured Time Delay, the 46BC protection function will operate. If the I2 value does not exceed the threshold for the required time, the 46BC function will be blocked and no trip will occur. This setting must be programmed in secondary amps. However, IPScom displays the corresponding primary value for reference purposes only.	
16	The 46BC function includes an optional Negative Sequence Voltage Restraint (V2) feature. When this option is enabled, the relay monitors the negative-sequence voltage (V2). If V2 exceeds its configured pickup level, the 46BC function is restrained: operation is blocked and the associated Time Delay is reset. Once the V2 condition clears (i.e., V2 falls below the restraint threshold), the 46BC function is permitted to resume timing based on the measured negative-sequence current (I2).	
17	Ensure that Output 1 is selected to assign the Trip command to this protection function.	

18	The Blocking Inputs can be used to inhibit operation of the 46BC function. If any configured Blocking Input – physical or virtual – is asserted, the 46BC function is immediately blocked , preventing operation regardless of the measured I2 value.	
19	Once the user selects the Save and Exit button, IPScom displays a confirmation message. If the settings were configured while connected to a unit , all changes are immediately saved and written directly to the unit.	
End of Procedure.		



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