
RSVBcon Software

User Manual

PromoChrom Technologies Pte. Ltd.

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1. Introduction

RSVBcon software is made ready for controlling the RSVB1000 interface board and RSVB1600 control board. It saves a developer the effort in learning a programming language. Users can quickly set up a method, test the method, and save the method for future use. Below are the major features of the RSVBcon software:

- 1) Automatic search and connection to a RSVB1000 board or a RSVB1600 board through a RS232 port or a USB port with a RS232 converter
- 2) Control of stepper motors and switches of outputs according to time and input status
- 3) Optional automatic shutdown in case of communication interruptions or PC malfunctioning
- 4) Read all inputs and update individual display panels every 0.05 second
- 5) Fast and easy setup of control methods involving only several mouse clicks or loading of an existing method
- 6) Selection of two triggering modes for remote start, one as host and the other as listener
- 7) On-line help for getting started and troubleshooting

The offline version of the RSVBcon software is the same as the on-line version except the real control part has been disabled. The offline version software may be used to develop methods before putting the method to an on-line RSVBcon software. A method built using the offline RSVBcon can be shared by the on-line version software.

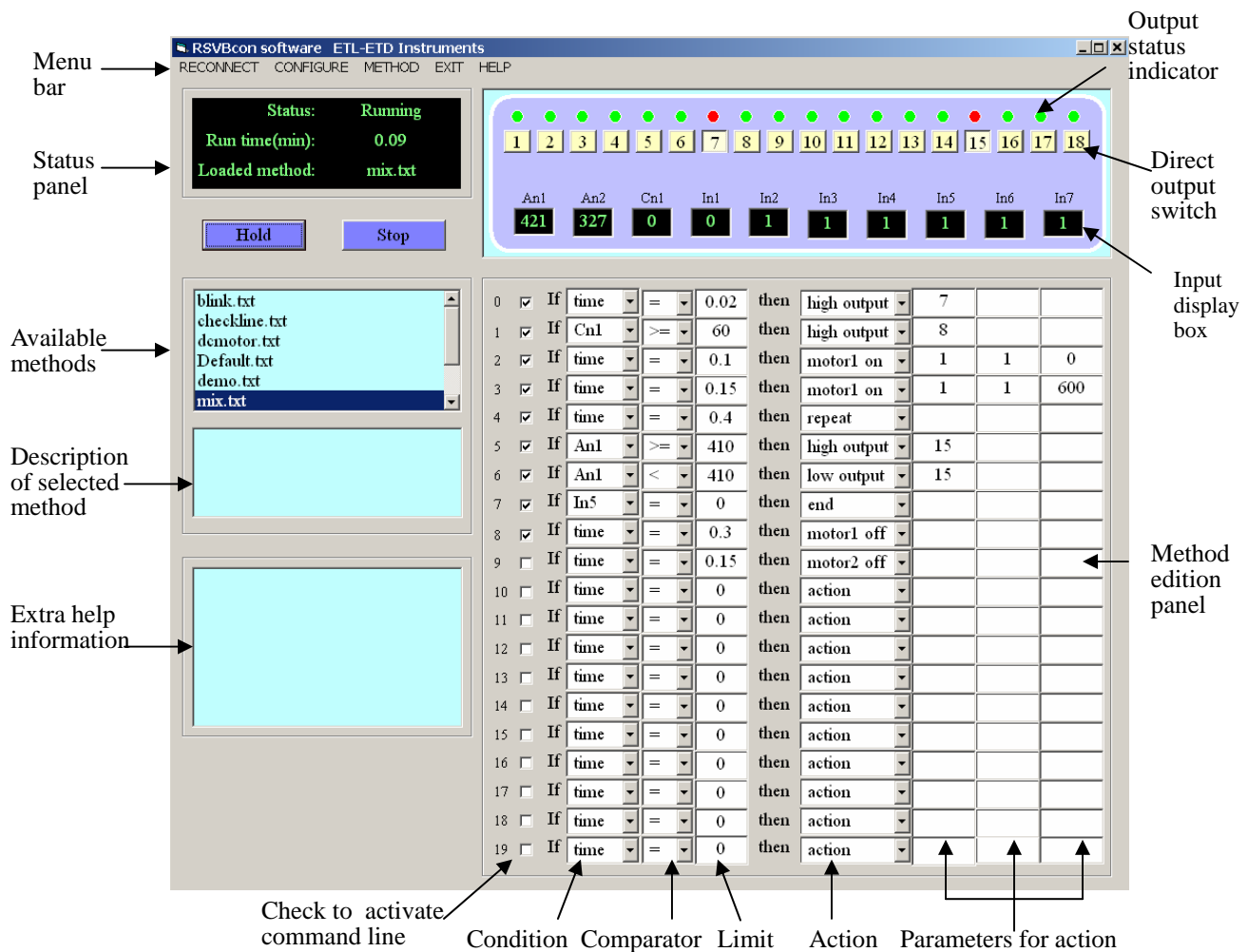


Figure 1.1 Function descriptions for the RSVBcon software user interface.

2. How the software works

The software works according to four terms: condition, comparator, limit, and action. The user tells what actions he wants to take under what conditions. A condition can be the run time or the value of an input from a RSVB board (such as an analog signal value, number of counts from Con1, or the logic status of an input). The limit is the threshold value of the condition. The comparator decides the relationship between a condition and a limit (such as =, >, or <). An action can be switching an output on or off, moving a stepper

motor to a specific position, clearing a counter, or restarting a process. The software will monitor all the conditions continuously. The scan rate is 0.05 second/cycle. Once a condition meets its preset limit, the action is triggered. Multiple conditions can be used to trigger one action.

When the software is launched at the first time, it will build a folder called RSVB in the C drive. The folder is used to hold information about RSVB board configuration and the methods. It will also record the last used method when the software is closed. So that when the software is launched again, the last used method is loaded again and is ready for use. User should not go into the RSVB folder directly for modification. The reliable way is going through the software interface for any change.

When the software is launched, it will search for the RSVB board within all the available communication ports (including COM ports converted from USB ports). If a RSVB1000 or a RSVB1600 board is connected to the PC and powered up, the RSVBcon software will establish the communication automatically. It will read all the input status from the board and display the result in the 10 input display boxes. The information in the input display boxes is updated every 0.05 second and is used by the software as conditions of the control. In case the communication is interrupted due to any reason, the software will give warning message and will pause the program.

Table 2.1 Summary of conditions and limits for RSVBcon software

Condition	Comparator	Limit range	Remarks
Time (Run time)	=	0 to 60000 min with 0.01 min resolution	Timing start when start button is clicked and is reset to 0 after stop.
An1 and An2	=, >=, >, <, <=	0-1024	Analog input (10 bit)
Cn1	=, >=, >, <, <=	0-60000	16 bit counter
In1 – In7	=	0 and 1	TTL compatible input

Table 2.2 Summary of actions and their parameters for RSVBcon software

Action	Parameter	Remarks
High output	1-18, 26, 27	Output number needs entered manually. When output number is 26 or 27, In6 or In7 is converted to output and set to high.
Low output	1-18, 26, 27	Output number needs entered manually. When output number is 26 or 27, In6 or In7 is converted to output and set to low.
Low all	None	Set all outputs to low
Motor1 on & motor2 on (motor1 uses output 1-4, motor2 uses output 5-8)	Direction	Can be 1 or 2
	Step interval	1-100 in millisecond
	No. of steps	1-60000
	Move to home	Motor will turn until In1=1 or In2=1
Clear Cn1	None	Set Cn1 counter to 0
Enable line	0-19	Make an unchecked command line checked. It can achieve multiple condition control by enabling another command line.
Repeat	None	Set run time to 0, switch all output to low and restart the running process
End	None	Stop taking actions

The RSVB1000 and RSVB1600 boards have a built-in feature called CloseWatch. It is for monitoring the communication between the PC and the control board. When this function is enabled, the board will check the input from PC regularly. If the board does not see any command from PC for some time (1 second), it will switch all its outputs to low. This is to prevent possible damages due to uncontrolled operation of the devices.

3. Getting started

3.1 Install the software

Insert the CD carrying the RSVBcon software to the PC and click at the setup.exe file.

The installation program will start automatically. Just follow the instructions of the program. In case there is an error message, choose ignore to continue. After the installation, the program can be started from start\programs\RSVBcon.

3.2 Set suitable configuration

Before launching the software, first connect a RSVB1000 or a RSVB1600 board to a RS232 port or a USB port with a RS232 converter and make sure the power for the interface board is switched on. When the RSVBcon software is launched, it will first search for the RSVB board. If the board is connected and working properly, the status will be “Ready”. Otherwise, status will be “connection failed”.

After launching the software, click at menu bar “CONFIGURE”. A form as shown in figure 3.1 will show up.

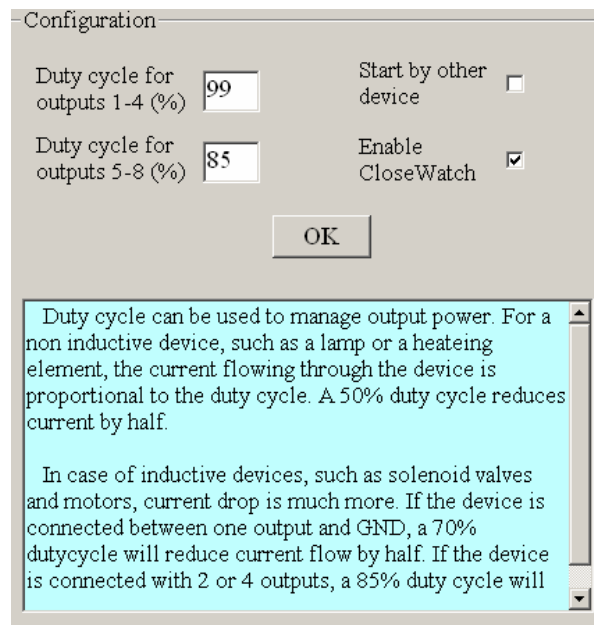


Figure 3.1 Configuration table in the RSVBcon software

The configuration form allows users to set PWM duty cycle for outputs 1-8, so that devices with working voltage lower than the supply voltage can be used. Users can also activate the CloseWatch function through this table. The third task of the configuration table is to decide the remote start mode. The default mode is self starting. It means the methods start running when the start button is clicked. When the board needs to work with other instruments, it may be necessary for the board to act according to the status of the other instrument. This function needs to work together with the 4-pin header on the RSVB1600 board. The 4 pins are for Gnd, In5, In6, and In7. When the mode is set as “start by other device”, In6 and In7 can only be inputs for monitoring the status of the other device. If the status of In6 becomes low, RSVBcon will start running the loaded method. When the status of In7 becomes low, the run will be stopped.

3.3 Build methods

If this is the first time that the software is launched, method “Default.txt” will be loaded. This method does not have any action. When the “Start” button is clicked, the method displays all the input data without taking any actions.

This default method can be used as a template for building a new method, as when the method is loaded, the whole method editing panel is cleared. A method is made by selecting conditions, comparators, limits and the actions in the method edition panel. Each line needs to be checked to enable the program to execute it. After the method is set, go to menu bar “Method” and choose “save method as” to save the method under a new name. After being saved, the new method will show up in the table for available methods. If the method name remains as Default.txt, the system will automatically reset the parameters as default values and the new information will be lost.

3.4 Run a method

To run a method, first load the method by clicking at the method name in the table of available methods. The relevant parameters will be set in the method panel. The run will start when the “Start” Button is clicked. When the software is closed, it will remember the last running method. So that when the software is launched again, the same method will be loaded. It is very helpful for those who use the RSVBcon for a routine work.

4. Examples of use

RSVBcon software is very simple yet very versatile. Here are some examples to demonstrate its capability.

- 1) The 3-line method will blink an output continuously with a 0.6 –second interval.

It may be used to drive a dosage pump or to blink a LED

0	<input checked="" type="checkbox"/>	If	time	=	0	then	high output	6		
1	<input checked="" type="checkbox"/>	If	time	=	0.01	then	low output	6		
2	<input checked="" type="checkbox"/>	If	time	=	0.02	then	repeat			

- 2) This 2-line method may be used to achieve temperature control using a analog temperature sensor or to achieve level control using an analog level sensor

0	<input checked="" type="checkbox"/>	If	An1	>	430	then	high output	5		
1	<input checked="" type="checkbox"/>	If	An1	<=	410	then	low output	5		

- 3) This example can be used for remote control of other devices. For the hardware, the 4-pin header on a RSVB1600 board is used as a remote connector. When the method is started, it will first monitor In5 for sensing the ready status of the other device. When In5 becomes low, In6 is converted to an output and set to high. This will trigger the start of the other device. After running for 7.5 minutes, In7 is converted to output and set to high. It will trigger the stop of the other device.

0	<input checked="" type="checkbox"/>	If	In5	=	0	then	high output	26		
1	<input checked="" type="checkbox"/>	If	time	=	7.5	then	low output	26		
2	<input checked="" type="checkbox"/>	If	time	=	7.5	then	high output	27		

- 4) Example 4 is for controlling a DC motor that has an encoder (like the one on a RSVB3000 experiment station). When the run start, the counter Cn1 is set to 0 and the DC motor connected to outputs 7 and 8 is on. When the counter reaches 600 (10 rounds), the motor moving direction is reversed. After another 10 rounds, all the outputs are switched off.

0	<input checked="" type="checkbox"/>	If	time	=	0.01	then	clear Cn1			
1	<input checked="" type="checkbox"/>	If	time	=	0.01	then	high output	7		
2	<input checked="" type="checkbox"/>	If	time	=	0.01	then	low output	8		
3	<input checked="" type="checkbox"/>	If	Cn1	>=	600	then	high output	8		
4	<input checked="" type="checkbox"/>	If	Cn1	>=	600	then	low output	7		
5	<input checked="" type="checkbox"/>	If	Cn1	>=	1200	then	low all			

- 5) The following method is for making a stepper motor move five steps every 0.1 minute. The move is controlled by two conditions: time and level of In4. Only when status of In4 is 1 and run time=0.02 min, the motor will make the move. Here In4 may be used to monitor status of another device

0	<input type="checkbox"/>	If	time	=	0.02	then	motor1 on	1	2	5
1	<input checked="" type="checkbox"/>	If	In4	=	1	then	enable line	0		
2	<input checked="" type="checkbox"/>	If	time	=	0.1	then	repeat			

5. Troubleshooting

5.1 The input display boxes are blank after start button is clicked

Either the communication has been lost or the RSVB board is not working. When the power for the RSVB board is switched on, the power status LED should light up. If the light is dim or not steady, either the power supply is of too small power or a device is drawing too much current. The power should be cutoff immediately before further troubleshooting. Next is looking at the output status LED for PWM2. It should light up when the board is powered on. The red light is a reliable indication that the board is working properly. If this light is not on, the board is not working. The cause could be either an unsuitable power supply or a damaged board. The ICs can be damaged if there is a short circuit in the wiring of the devices.

If the board is working properly, the next cause can be the cable connection. Make sure the two ends of the RS232 cable are properly connected. If the problem still exist, try restarting the computer and launch the software again.

5.2 The method is not running as expected

The check boxes for each command line need to be checked to make a line executable. Make sure the boxes are checked before saving a method.

A new method needs to be saved before it can be used. After setting up a method or modifying a method, save it before starting the run. When Default.txt is used as template for method building, save the method under another name (go to menu bar “Method” and click on “save as” menu bar). If the method is saved using name “Default.txt”, the

software will change it to its original form when the software is launched again.

Check for conflicts in the method. It is possible that the action is cancelled by another action in another line. The offline version RSVBcon may be used to test the method before putting it to real control.

5.3 The status is “connection failed” after launching the software.

The causes are the same as in section 5.1. After checking the cable connections and the power on the interface board, click on menu bar “RECONNECT” to re build the connection. The status should become “Ready” if the problem has been rectified.

5.4 Other errors

The computer may generate other errors due to unexpected situations (such as a jammed PC or slow response from interface board). Normally the problem can be solved by restarting the computer, power cycling the interface board and then re-launching the software.

5.5 Difficult problems

If the problem last, PromoChrom Technologies can be contacted using email info@promochrom.com. Our support people will try their best to help.