

# CIC ENGINEERING

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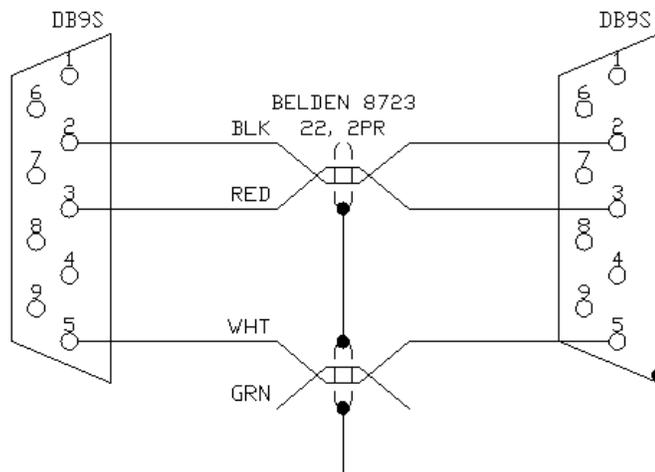
## μMPIS Control Software

### Overview

The μMPIS Control software package allows for a user to control the operation of the uMPIS unit with a PC. The PC and the uMPIS unit are connected together using a RS232 link. The software allows the user to edit, save, and load the channel configuration. The software also allows the user to import speed timing waveforms generated by Excel and download the waveforms to the uMPIS unit.

### Communication

The uMPIS unit communicates using a standard RS232 link. The communication parameters are: 9600 baud with no parity, 8 data bits, and 1 stop bit. The cable should be a straight through cable. Pins 2, 3, and 5 are the only pins needed. Both ends should be male connectors (sockets). The schematic of a serial cable is shown in the following picture.



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## Control Form

Options Help

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| Channel 1<br>CHANNEL 01<br>50.0 % 500 Hz  | Channel 2<br>CHANNEL 02<br>50.0 % 500 Hz  | Channel 3<br>CHANNEL 03<br>50.0 % 500 Hz  | Channel 4<br>CHANNEL 04<br>50.0 % 500 Hz  | Channel 5<br>CHANNEL 05<br>50.0 % 500 Hz  | Channel 6<br>CHANNEL 06<br>50.0 % 500 Hz  |
| Channel 7<br>CHANNEL 07<br>50.0 % 500 Hz  | Channel 8<br>CHANNEL 08<br>50.0 % 500 Hz  | Channel 9<br>CHANNEL 09<br>50.0 % 500 Hz  | Channel 10<br>CHANNEL 10<br>50.0 % 500 Hz | Channel 11<br>CHANNEL 11<br>50.0 % 500 Hz | Channel 12<br>CHANNEL 12<br>50.0 % 500 Hz |
| Channel 13<br>CHANNEL 13<br>50.0 % 500 Hz | Channel 14<br>CHANNEL 14<br>50.0 % 500 Hz | Channel 15<br>CHANNEL 15<br>50.0 % 500 Hz | Channel 16<br>CHANNEL 16<br>50.0 % 500 Hz | Channel 17<br>CHANNEL 17<br>50.0 % 500 Hz | Channel 18<br>CHANNEL 18<br>50.0 % 500 Hz |
| Channel 19<br>CHANNEL 19<br>50.0 % 500 Hz | Channel 20<br>CHANNEL 20<br>50.0 % 500 Hz | Channel 21<br>CHANNEL 21<br>50.0 % 500 Hz | Channel 22<br>CHANNEL 22<br>50.0 % 500 Hz | Channel 23<br>CHANNEL 23<br>50.0 % 500 Hz | Channel 24<br>Name<br>50.0 % 500 Hz       |

Change Channel  
Channel 1

Name: CHANNEL 01  50%  
Duty Cycle (%): 50.0  5kHz  
Frequency (Hz): 500  500Hz

Apply Changes Full Refresh

Note: This software requires firmware 3.1 or later on the uMPIS master.

Port 1 Open None 9600,N,8,1

The uMPIS Control form allows the user to view/edit the individual sensor channels. A sensor channel can be selected by clicking anywhere in the frame for that channel. The currently selected channel is highlighted in red. Each frame shows the channel's name, current duty cycle, and current frequency. The information for the currently selected channel is copied to the Change Channel frame at the bottom of the form.

The Change Channel frame has text boxes that allow the user to edit the channel's information. Press the Apply Changes button to save the edited information to the uMPIS unit. The 50% checkbox will configure the channel to lock the duty cycle to 50%. The 5kHz/500Hz checkbox will configure the channel to lock the frequency to either 5kHz or 500Hz.

The Full Refresh button request the data for all channels in the event the software and uMPIS get out of sync. The uMPIS Control software will do a full refresh automatically at startup and periodically if no messages are sent from the uMPIS. The uMPIS will automatically send a message every time the setup has changed for a channel.

A red bar will appear to indicate if communication errors are encountered.

The status bar at the bottom displays the current communication parameters.

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The Options menu has 4 entries – Comm Settings, Save Channel Setup, Load Channel Setup, and Speed Timing Editor.

**Comm Settings** - This option will bring up a form that allows the user to change the communication parameters.

**Save Channel Setup** - This option will save the current channel information (name, duty cycle, etc) to a text file.

**Load Channel Setup** - This option will load a previously saved channel information file and transfer the contents to the uMPIS unit.

**Speed Timing Editor** - This option will load the speed timing editor form. See the speed timing editor section for additional details.



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The Up and Down buttons can be used to change the order of the waveforms. The order shown in the list box will be the same order as shown on the speed timing selection menu.

The Add Waveform button will bring up a common dialog box that will allow the user to select a CSV file to import.

The Delete Waveform button will delete the currently selected waveform from the list box.

The Transfer Waveform button will transfer the loaded waveforms to the uMPIS. This process will completely erase all current waveforms stored on the uMPIS. There is no way to simply append waveforms to the uMPIS.

The Transfer Progress bar will indicate the current position of the transfer.

The Status box will log various events for diagnostic or troubleshooting purposes.

The close button will close the Speed Timing Editor form.

The A, B, and C graphs show a pictorial representation of the currently selected waveform.

Below is the format of a CSV file. The first line can contain anything. The example has column headers shown. Each line after the first line is a discreet state. The first field in the line is ignored. The example shows the state number. The next 3 fields are the C, B, and A fields in that order. Any extraneous data on a line is ignored. The first line that does not have a valid value for C, B, and A will terminate the file read.

An Excel file can be requested that will have the correct format and the ability to graph the waveform within Excel to aid with waveform editing. Once the graph is correct the file can then be converted to CSV and imported using the uMPIS Control software.

## Example CSV File

```
State,C,B,A
0,1,1,0
1,0,1,0
2,0,0,1
3,0,0,1
4,0,1,0
5,0,1,1
6,0,0,0
7,0,0,1
8,0,1,0
9,0,1,0
10,0,0,1
11,0,0,1
12,0,1,0
```