

USER MANUAL

Shimmer DSC module

Shimmer DSC module documentation

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Here it can be found documentation regarding the Shimmer DSC module.

1. Scope of the project

1.1. About Shimmer

SHIMMER is a small sensor platform well suited for wearable applications. The integrated 3-axis accelerometer, large storage, and low-power standards based communication capabilities enable emerging applications in motion capture, long-term data acquisition, and real-time monitoring.

SHIMMER2, the latest revision of the SHIMMER platform adds improvements based on years of field trials and deployments. The most dramatic change is a patent-pending direct-to-host data transfer path from SHIMMER's MicroSD card to hasten data offload, minimize user training, and provide fail-safe data access. Power control features have been added including soft-power switching and low-battery shutdown. Finally a passive vibration sensor was added— this sensor efficiently signals when the device is in use.

1.2. About Labview

LabVIEW is a graphical programming environment used by millions of engineers and scientists to develop sophisticated measurement, test, and control systems using intuitive graphical icons and wires that resemble a flowchart. LabVIEW offers unrivaled integration with thousands of hardware devices and provides hundreds of built-in libraries for advanced analysis and data visualization. The LabVIEW platform is scalable across multiple targets and operating systems, and since its introduction in 1986 has become an industry leader.

The programming language used in Labview it is called G and is a data-flow programming language. Execution is determined by a graphical block diagram.

<http://www.ni.com/labview/>

1.3. Why this project

For rapid development of applications is needed a module that reads and logs data from a Shimmer device. To achieve this was created a DSC module that read data from the device and using shared variables, the data can be displayed and manipulated in any Labview program.

On your Shimmer device use the same firmware as BioMOBIUS, i.e. AccelGyro, AccelECG, ECG.

2. Requirements

In order to use the DSC module you need to fulfill the following hardware and software requirements.

2.4. Hardware

Shimmer device from <http://shimmer-research.com>

2.5. Software

Labview 2009 <http://www.ni.com/labview/>

Labview 2009 DSC module <http://sine.ni.com/nips/cds/view/p/lang/en/nid/10418>

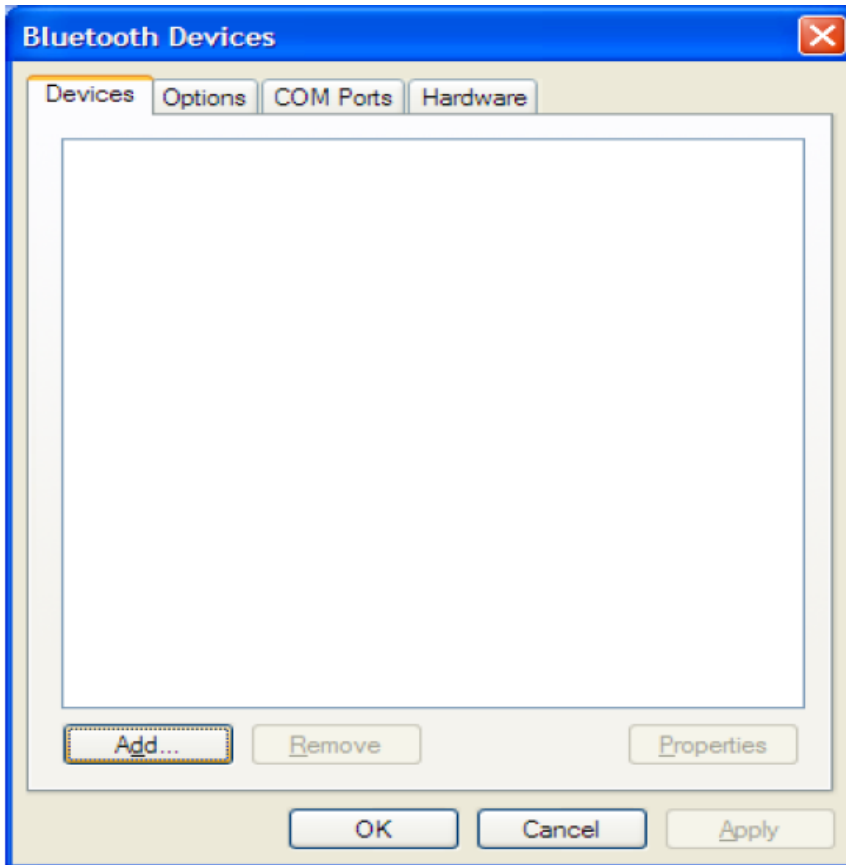
Same firmware as BioMOBIUS, i.e. AccelGyro, AccelECG, ECG.

3. User Manual

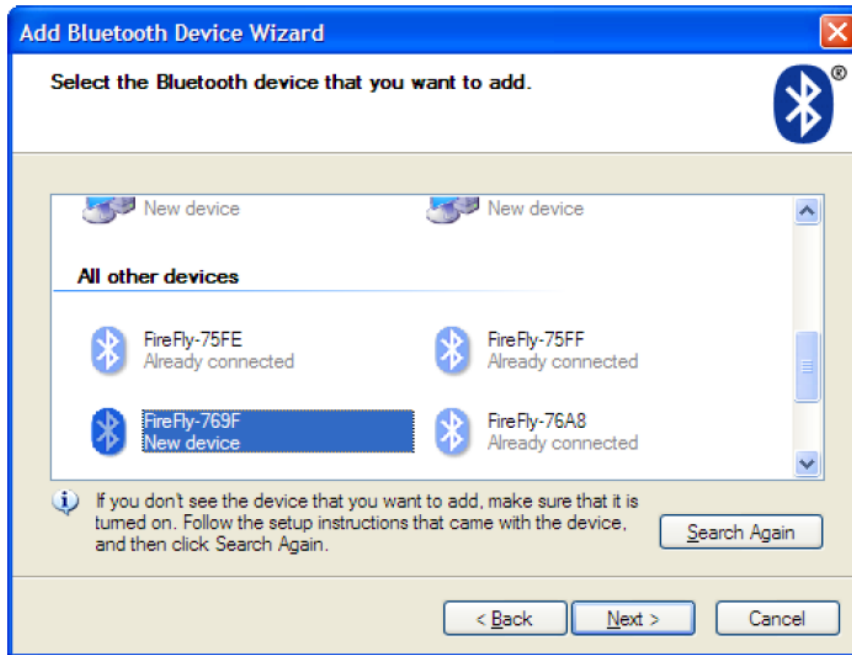
3.6. Configure Bluetooth connection

Power up the SHIMMER. The SHIMMER Bluetooth radio is by default in discoverable mode, so it should be seen by your dongle. Obviously, you can skip Bluetooth pairing if you have already done it.

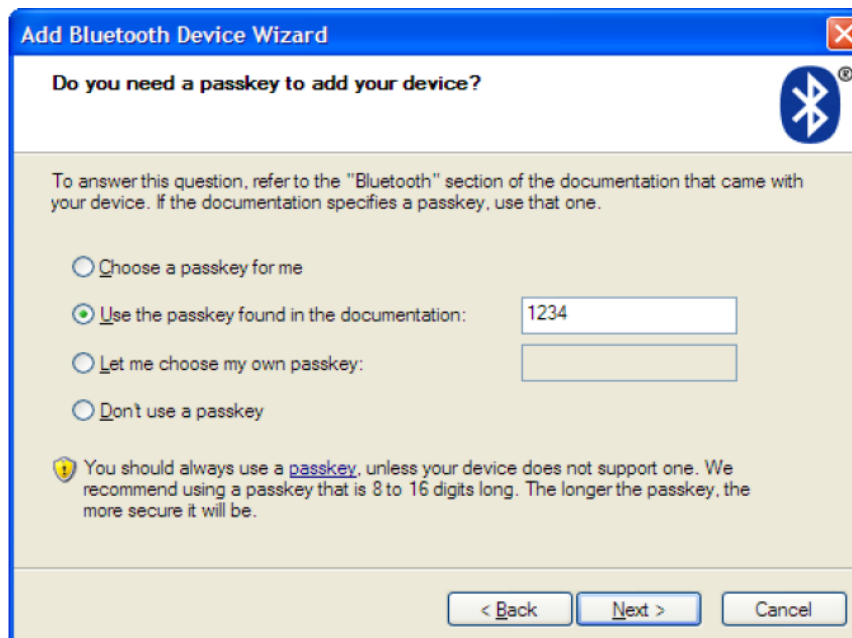
Open up the Windows Bluetooth Stack (blue Bluetooth icon on notification area) and search for your SHIMMER by clicking on the Add button.



This shows all Bluetooth devices within range and your SHIMMER device will be found and have a name in the format –FireFly-XXXX. The XXXX represents the last 16 bits of the 48-bit Bluetooth Device Address.



Proceed to pairing with the SHIMMER by clicking Next. We should not have to use any security because authentication and encryption is disabled in SHIMMER but there is a bug in the Microsoft Bluetooth Stack which requires a pass key anyway. So put in the SHIMMER default passkey of -1234



The Bluetooth module on SHIMMER supports the Bluetooth Serial Port Profile and so Windows installs an Incoming COM port and outgoing COM port to communicate with the SHIMMER.

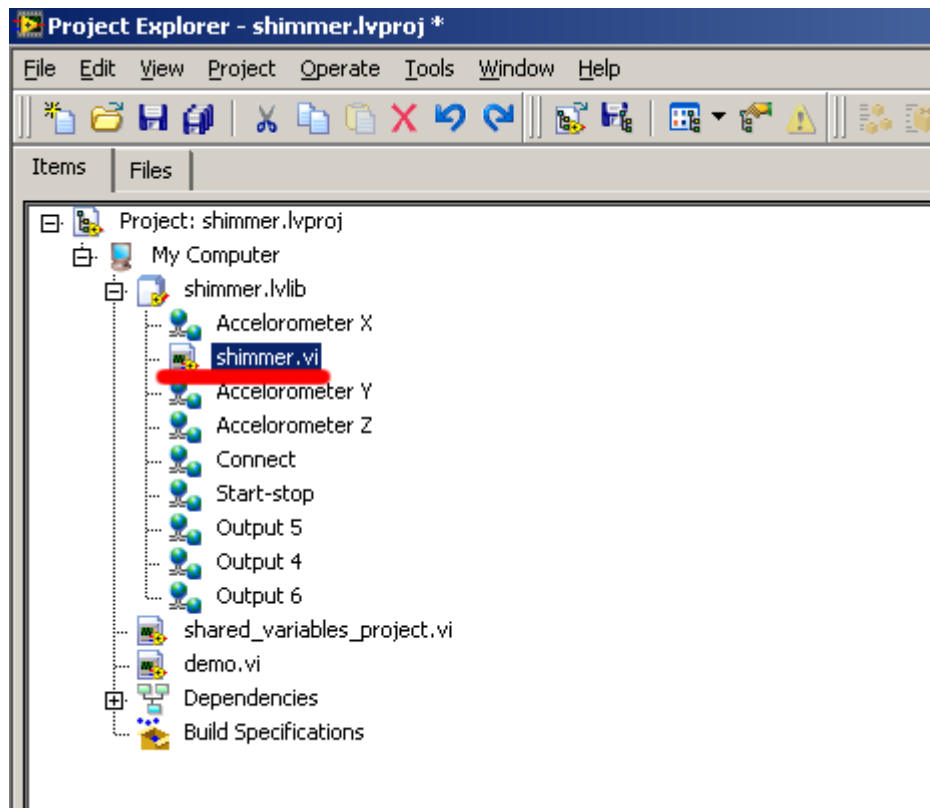
The outgoing COM port, COM17 in our case can now be used by any COM port application on the PC to connect to the SHIMMER.

3.7. Start the module

Start Labview 2009.

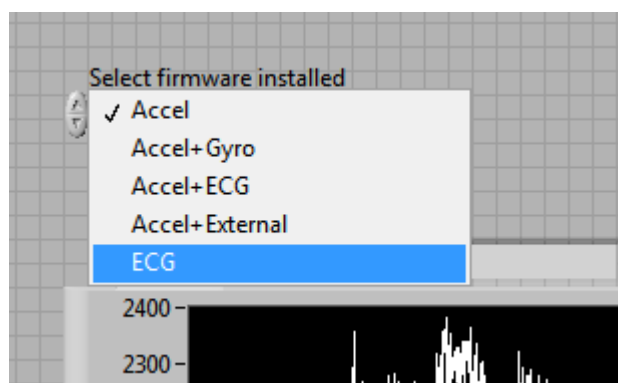
Open the project with the shimmer module.

In the project is a library called shimmer.lvlib. Open the library and click on shimmer.vi which is highlighted in image below:

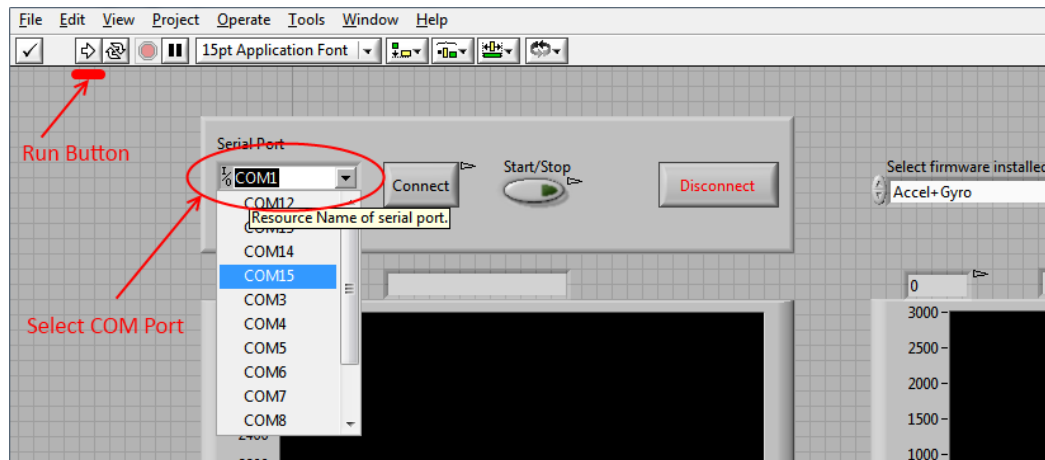


Now the module is opened and ready to start.

First select which firmware is installed on your Shimmer device



Start the program with CTRL-R or by pressing the Run button.



Select the serial port from Chapter 3.6 of your shimmer serial device (COM17 in the above example). Then click Connect, Shimmer device green led should be on.

If your Shimmer device has a different firmware you must Disconnect and select the new firmware. Now start again the module.

Click Start in order to switch on the module. Now data is automatically logged and can be seen from Historical Data, see chapter 3.9.

3.8. Use of module

Start a new vi program

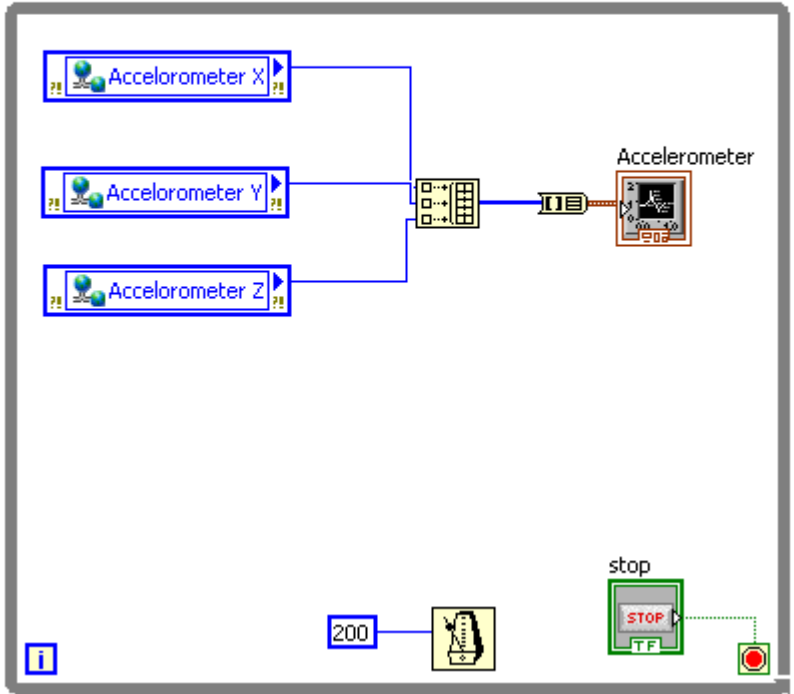
Add shared variables on the block diagram

Below is an example of a vi program that uses the shared variables from the Shimmer device.

demo.vi Block Diagram on shimmer.lvproj/My Computer

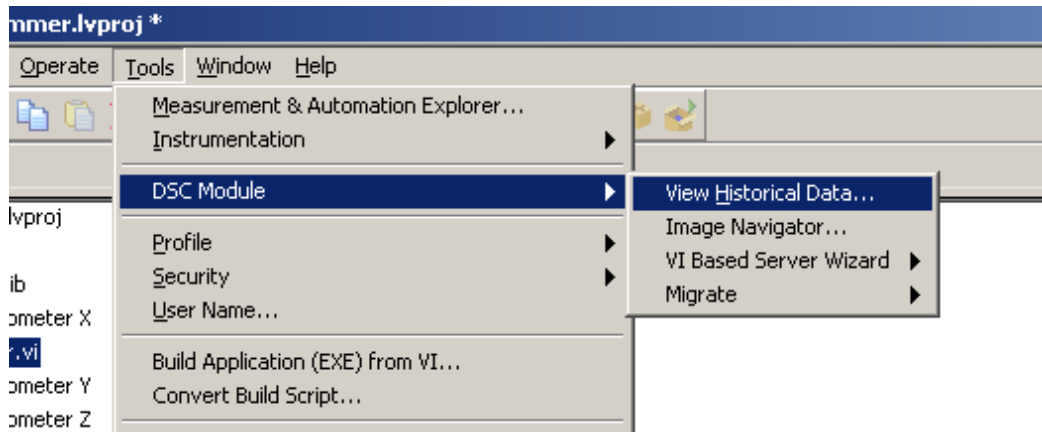
File Edit View Project Operate Tools Window Help

13pt Application Font



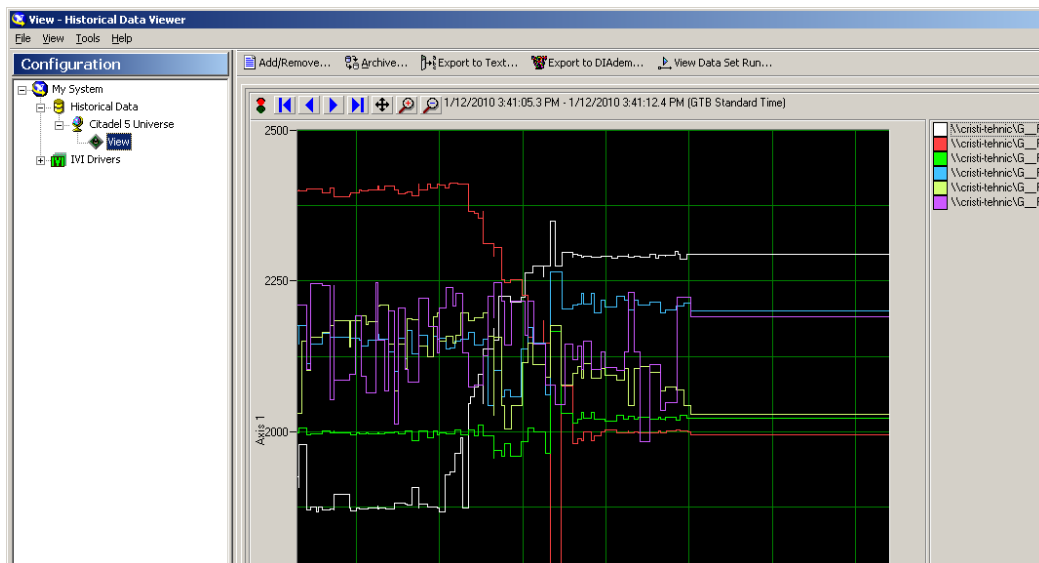
3.9. View historical data

This option is available from Tools-> DSC Module -> View Historical Data...



The Historical Data Viewer allows you to manage and view Citadel logging data. The Citadel database is included with the Labview DSC module. You can use the Historical Data Viewer to perform the following tasks:

- Create custom data views to display trace, alarm, and event data
- Archive data, Export data
- View historical data



3.10. Video Demo

A demo movie showing how to use the module can be found at:
<http://shimmer-research.com/wordpress/demo/demo.html>