

FIBULA

Quick Start Guide

Jean-Marie Ory

1 Introduction

FIBULA-G allows you to build Real Time applications running on the DSP563xx family of DSP processors.

FIBULA-G is an Integrated Development Environment.

The typical development process can be described by 3 steps:

- 1 Draw application schematics (interconnect some functional blocks from the library and give parameters)
- 2 Compile to ASM code; Assemble; link; Load code to target; Run target
- 3 Check if application requirements are met, if not, then modify parameters and return to step 2

Step 1 only needs a few mouse clicks and some parameter entries

Steps 2 is performed by clicking this single button:



Step 3 can be accomplished by running virtual instruments such as an 8 channel oscilloscope, a spectrum analyser or an histogram.

2 Installation

2.1 Run Installation CD Program

Execute this program from the installation CD and follow instructions:



Fibula_Install.exe

Check the License acceptance checkbox;

Give the destination directory (usually C:\Program Files)

The installation program copies files, and puts a shortcut on the desktop.

Tell if you want to write protect Fibula reference files against modification or deletion: YES recommended

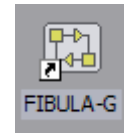
Tell if you want to associate FIB files with FIBULA : Answer YES (unless "FIB" extension is used for another purpose on your system)

Tell if you want to hide the history of previously edited files: Only recommended if FIBULA is used for classrooms.

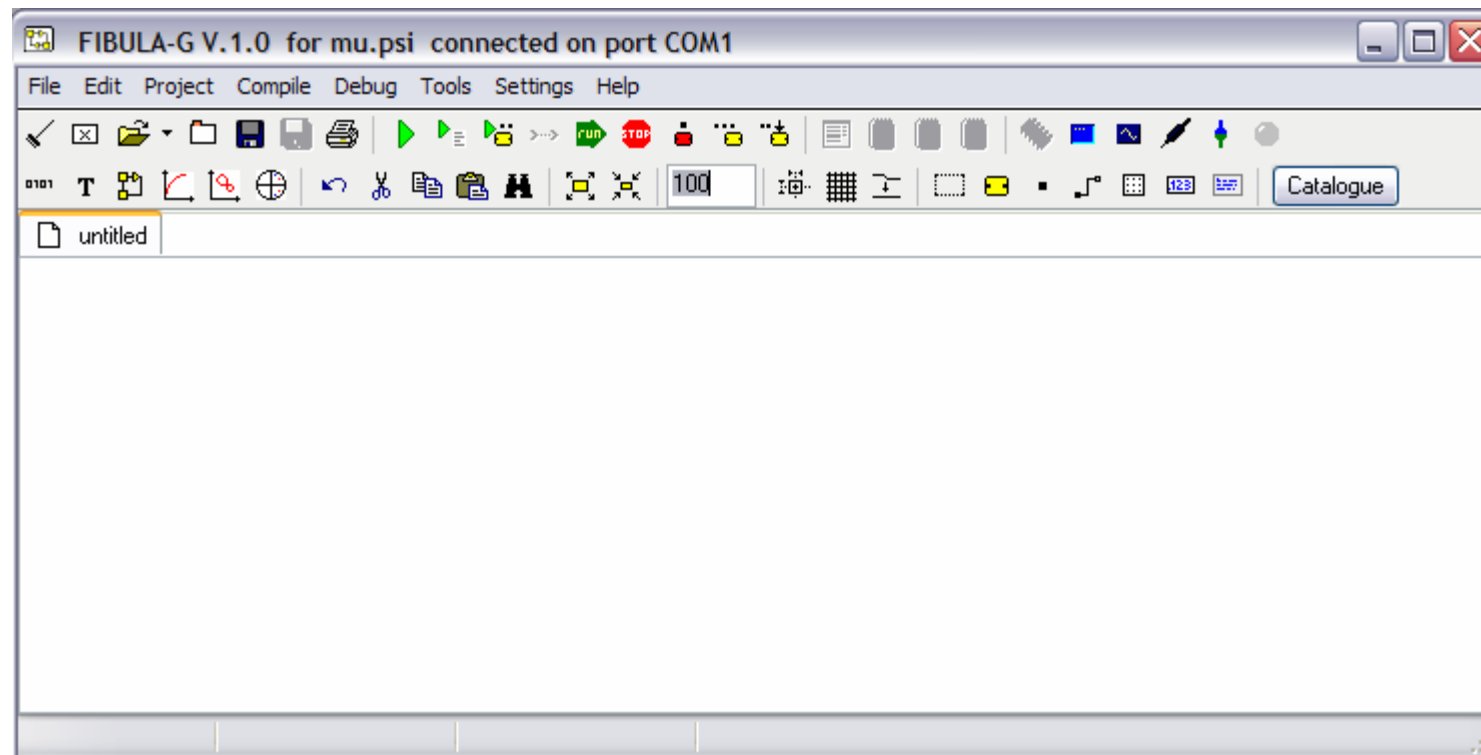
The FIBULA software is installed.

2.2 Launch FIBULA-G

Double-click the FIBULA-G shortcut



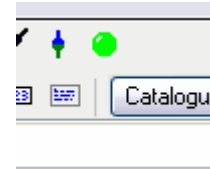
The FIBULA-G window opens like that:



Connect the serial (DB9 to DB9) cable between your PC serial port and the RS232 port on Mu.Psi card.

Apply power on Mu.Psi

The virtual LED (right of the upper toolbar) should turn GREEN to indicate that the computer and Mu.Psi are communicating:



If it remains gray, then,
press on the MuPsi Reset button
click on the led

If the led turns red then either connect the cable on another available port,
or execute the menu command :

Settings | Serial Port | Port | COM2 etc. ..

Perform the test again until you get the green led.

Once successfull, do the command

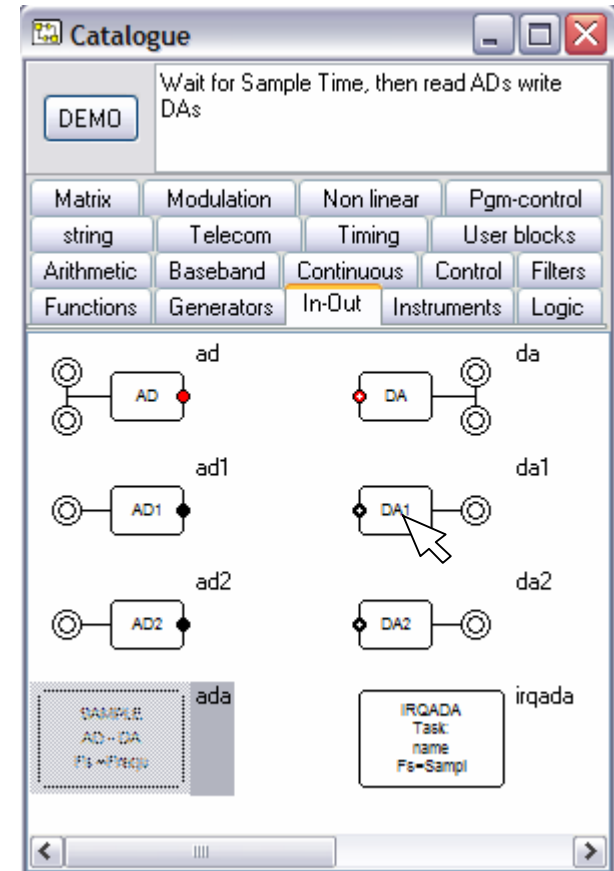
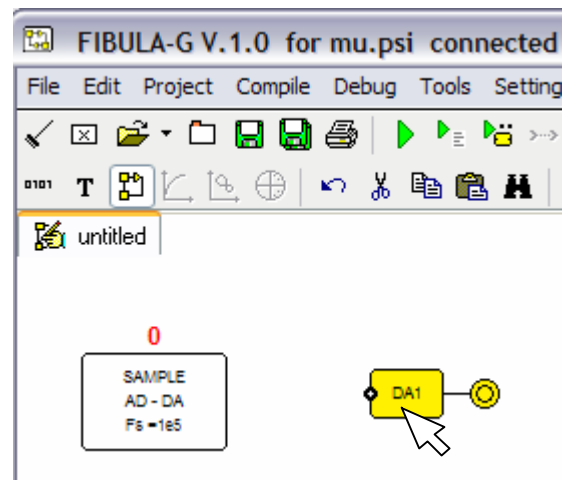
Settings | Save settings

2.3 Drawing a block diagram

Click on the Catalogue button to open the catalogue



Select the "In-Out" tab;
select the block 'SAMPLE AD-DA' (ada) by clicking on the icon,
then click on the fibula workspace to deposit the selected block.
Deposit a DA1 block in a same manner.



Select the "Generators" tab. Deposit a sinewave generator G_SIN.

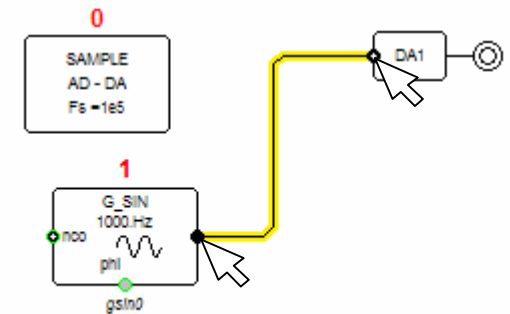
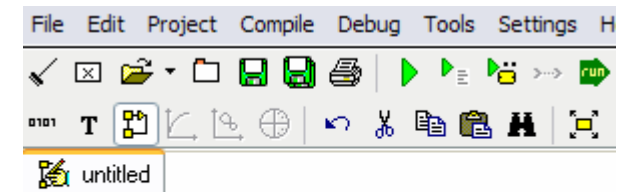
2.4 Create a connection

On the toolbar, press the connection button



Click on the black dot at the right side of the G_SIN block (output), then click on the DA1 input on it's left side.

The DA1 converter is now connected to the sine generator output.



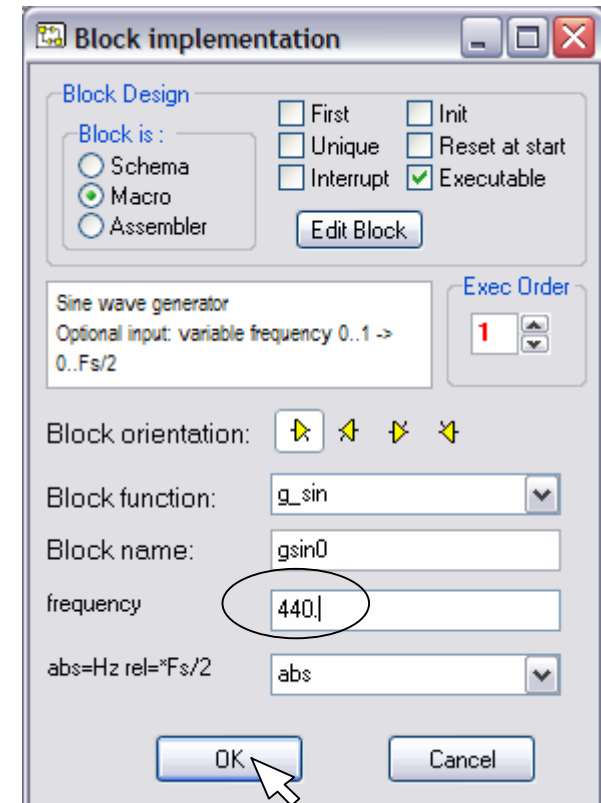
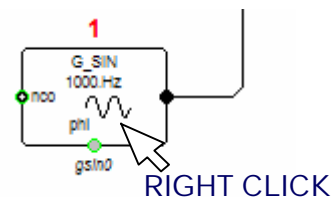
2.5 Change block parameters

To get a sine wave of 440Hz in place of 1000Hz:

Right-click on the G_SIN block

In the Block Implementation window, change the value of "frequency"

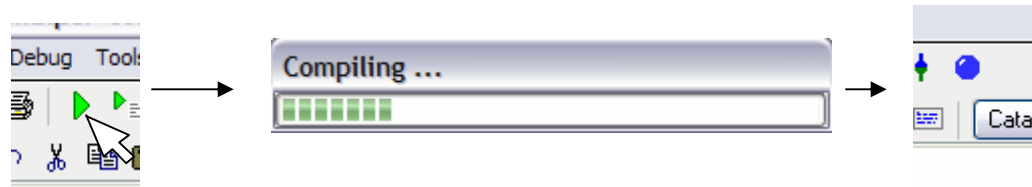
Click on "OK"



3 Compiling and testing

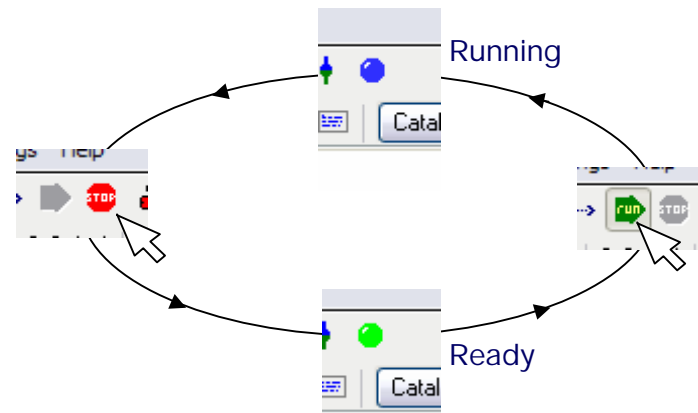
3.1 Compiling and running

Press the Compile-Load-Run button:



If no errors occurred, after a while the status LED turns blue, indicating the DSP program is running within the target.

Once the program is running, you may stop it either by clicking the STOP button or clicking the status LED. Then you can get it running again by clicking the RUN button



3.2 Testing the application

Connect an oscilloscope on DA1 to view the 440Hz sine wave
or connect an PC loudspeaker to DA1 to listen the generated tone.

3.2.1 Virtual instruments

If you haven't an oscilloscope, you can implement a virtual instrument to view the waveform.
A virtual instrument is block with DSP routine that sends data to FIBULA through the serial line.
Associated to that block a Fibula program displays the received data on the computer screen.

Attention: in FIBULA V0.0, only one virtual instrument may be used at a time !

3.2.2 The Miniscope

To view a signal with the Miniscope, just install a Miniscope block on diagram without any connection and recompile. (Resize Miniscope icon dimensions if necessary).

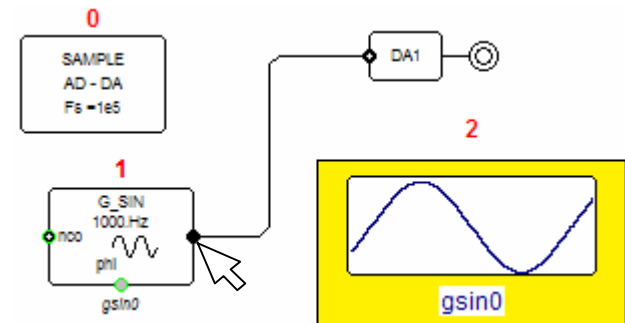
Since the displayed image is 1 pixel per sample, a big size will give a slower update rate.

Vertical display range is $[-1..+1]$ for fractional variables.

While the DSP program is running, just bring the mouse cursor over a block output or input to display corresponding signal.

When the DSP is stopped the miniscope screen displays address and value of pointed variable.

Miniscope supports fractional, complex and boolean variables



Now, if you want to test the 8 channel Scope, first delete the Miniscope block by selecting it (left click) and then pressing DELETE on the keyboard.

3.2.3 The 8 channel virtual oscilloscope

To view a signal with the virtual oscilloscope, just implement the SCOPE block on your diagram without any connection.
The channels to view are defined by probes installed on outputs or inputs.

To install a probe, click the probe button  then click the desired outputs or inputs. The numbers appearing on the terminals are the channel numbers.

(You may change channel numbers by editing terminal properties).

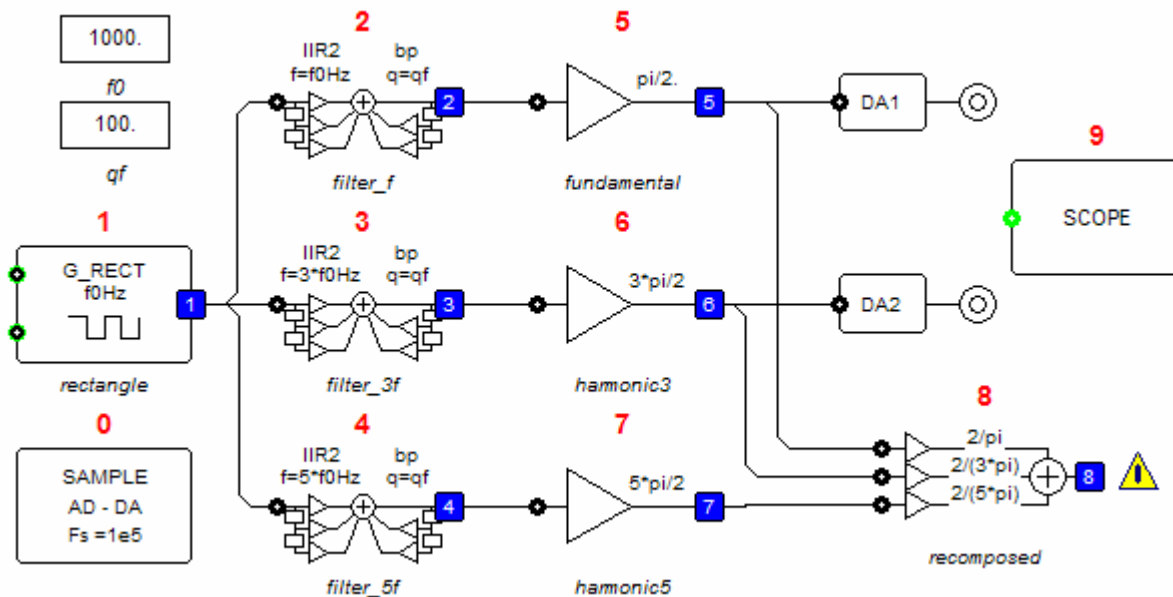
Let's check the scope on a more complicated diagram:

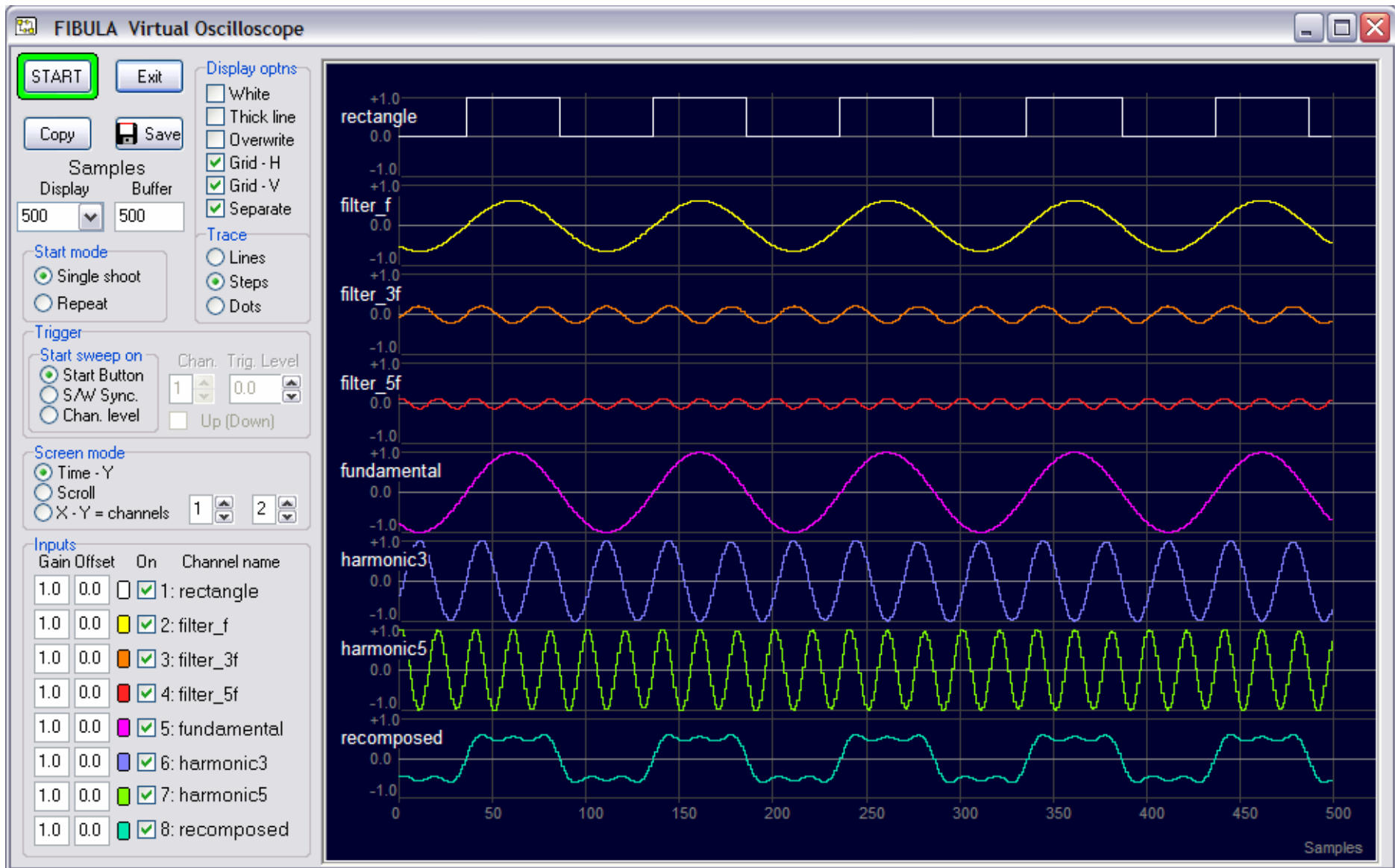
Open a new page by clicking the new page button .

In this diagram we generate a 1000Hz rectangular waveform of amplitude 1

We filter this signal with narrow bandpass second order IIR filters at frequencies 1000, 3000, 5000 Hz in order to extract the fundamental, and harmonics 3 and 5. We apply adequate gains to get 3 sinewaves with amplitude 1.

Then we make a weighted sum of these 3 waves in order to approximate the original signal up to Harmonic 3 and without the DC component.





3.2.4 The Spectrum Analyser



3.3 Graphical objects

3.3.1 Blocks

3.3.2 Data

3.3.3 Deflists

3.3.4 Matrixes

3.3.5 Connections

3.3.6 Comments

3.4 Mouse – Keyboard graphical commands summary

3.4.1 Set FIBULA in graphical mode

3.4.2 Create object

3.4.3 Select object

3.4.4 Displace object

Left click on object: **select object**.

