

GP / Xpress Series

Getting Started Guide



FCC Compliance

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation

Caution

Any changes or modifications of the device, not expressly approved by Byte Paradigm sprl, that could modify the FCC compliance of the device, could void the user's authority to operate the equipment.

Information to the user

Class A digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



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References

- [1] GP-22050 data sheet (ds_GP22050.pdf). This file contains all the technical information and specification concerning the GP-22050 device.
- [2] 8PI Control Panel application for the GP-22050 device (ug_GP22050_8PIControlPanel.pdf). This file contains the 8PI Control Panel user's guide.
- [3] TCL Library description (ug_GP22050_TclLib.pdf). It contains a detailed description of the procedures available within the TCL scripting environment.
- [4] C/C++ DLL description (ug_GP2250_CLib.pdf). It contains a detailed description of the functions available in the provided DLL.
- [5] SPI Xpress data sheet (ds_SPIXpress.pdf)
- [6] Wave Generator Xpress data sheet (ds_WaveGeneratorXpress.pdf)
- [7] I2C Xpress data sheet (ds_I2CXpress.pdf)

History

Version	Date	Description
1.00	29-Sep-2008	Initial revision
1.01	26-August-2009	Added HW release changes
1.02	10-December-2009	Added GP-24100 label
1.03	February 2010	Some minor updates

1 Package Content

The standard base package delivered with the GP or Xpress device is composed of the hardware and software items listed in Table 1. Verify that your kit is complete before you start using it. Figure 1 shows an example with the GP-22050 as device.

Figure 1: GP-22050 base package



Table 1: GP or Xpress package content

Items	Quantity
GP or Xpress Series device in an anti-static bag	1
USB cable, 2m, USB A male to mini B	1
Kit of flying lead wires	
2-way red	1
2-way black	4
8-way multi-colour	3



The following modes of operation are delivered with:

- **GP-22050 BASE:**
 - ▶ **Arbitrary Digital Waveform Generator**
This ADWG application configures the device as a driver. The user can then apply arbitrary waveforms (arbitrary digital patterns) on the digital output of the GP-22050 device system connector.
 - ▶ **State Analyser**
This analyser application lets the GP-22050 operate like a logic analyser. The device is then configured as a receiver. An internal or external clock reference can be used.
 - ▶ **JTAG interface controller**
With this application the user can easily control any JTAG interface.
- **SPI Xpress :**
 - ▶ **SPI Master / Analyser**
This mode of operation lets you use your SPI Xpress device as 3- and 4-wire serial peripheral interface protocol exerciser and analyser.
- **Wave Generator Xpress:**
 - ▶ **Arbitrary Digital Waveform Generator (see above)**
- **I2C Xpress:**
 - ▶ **I2C Master / Analyser:**
This mode of operation lets you use your I2C Xpress device as a I²C protocol interface exerciser and analyser.

Each device receives a license file that activates its modes of operation in the SPI Control Panel. You must claim your license file from support@byteparadigm.com or using the contact form on Byte Paradigm's web site.

I2C and SPI mode of operation are available as a option for GP Series devices.

These operating modes can be configured and controlled using the provided graphical user interface *SPI Control Panel*. All available features in the GUI can also be accessed using TCL scripting through a provided TCL library and console environment, enabling tasks automation and simple custom application development. The user can also develop its own application by using the provided C/C++ DLL, which gives access to the same features as the ones of the GUI and TCL environment. Using the C/C++ DLL also allows the user to control the GP or Xpress device from third party applications and front-ends.


2 Usage Recommendations

The GP or Xpress device is delivered in an anti-static bag. This device is sensitive to electrostatic discharge. It must be manipulated with care.



Electrostatic discharges can damage the GP or Xpress device. It is highly recommended for the user to be connected to ground when manipulating the device and to use the device in an ESD safe environment.

As for any electronic component, absolute maximum ratings have been defined for the GP or Xpress device system connector. When connecting the device to another system, the user must ensure that all DC and AC characteristics of the system connector are respected. The absolute maximum ratings are summarised on the device top side. Refer to [1], [5], [6] or [7] for a complete description of the AC and DC characteristics and absolute maximum ratings.

-  *To avoid damaging the GP or Xpress device, the user has to use the device within the recommended AC and DC ranges and never operate beyond the limits defined by the absolute maximum ratings.*



3 First Steps with GP or Xpress device

3.1 Driver and Software Installation

Before connecting the GP or Xpress device to your computer and being able to use it, the user has to install the device drivers and control panel application.

Run the installation file downloaded from Byte Paradigm's web site. The latest version of the drivers and software application can be downloaded from the Byte Paradigm web site (www.byteparadigm.com). Click on support > download

3.2 Check hardware revision

Check serial number located at the back of the device with a barcode, to find the hardware revision.

According to the hardware revision, the following elements vary:

Hardware revision 2 first digits	In/out clocks on user interface connector	External power source selection
01	<p>ClkOut pin is located on pin labelled D21 / C5</p> <p>ClkIn pin is located on pin labelled D20/C4</p>	Using external power source for I/Os requires properly positioning the power selection jumper AND applying the external voltage onto the VEXT pins of the user interface connector
02	<p>ClkOut pin is dedicated to output clock and is labelled CkOut (GP / Wave Generator Xpress) or SCLKo (SPI Xpress)</p> <p>ClkIn pin is dedicated to input clock and is labelled CkIn</p>	Using external power source for I/Os requires its application on the side power source connector after having removed the jumper.
03		



HARDWARE REVISION STARTS WITH "01"

VEXT pins are located on the user interface. CLKOUT / CLKIN use D21 and D20 (C5/C4)

ABSOLUTE MAXIMUM RATINGS			
Feature	Min	Max	Unit
VEXT	-0.5	+3.75	V
VIN	-0.5	+3.75	V
VOUT	-0.5	Vcc+0.5	V

RECOMMENDED OPERATING CONDITIONS			
Feature	Min	Max	Unit
VEXT	-1	+3.3	V
IO / pin	2	8	mA
IO TOT	-	120	mA
IO TOT	-	300	mA

POWER SELECTION
 internal
 external

GP-22050 Accelerator

byteparadigm

Using VEXT requires properly positioning a jumper

HARDWARE REVISION STARTS WITH "02" OR "03"

CLKOUT / CLKIN are dedicated on the user interface.

ABSOLUTE MAXIMUM RATINGS			
Feature	Min	Max	Unit
VEXT	-0.5	+3.75	V
VIN	-0.5	+3.75	V
VOUT	-0.5	Vcc+0.5	V

RECOMMENDED OPERATING CONDITIONS			
Feature	Min	Max	Unit
VEXT	+1.25	+3.3	V
IO / pin	-	8	mA
IO TOT	-	120	mA
IO TOT	-	300	mA

USB
 GND
 VEXT

GP-22050 Generator • Analyser

50 MHz up to 1MB

byteparadigm

VEXT pins are on the side of the device. Jumper must be removed to use them

3.3 Connecting the GP or Xpress device

3.3.1 GP / Xpress device Connectors

The GP-22050 is taken as an example below. Xpress device have the same connectors.

Figure 2: GP-22050 Top View – hardware revision starting with 01

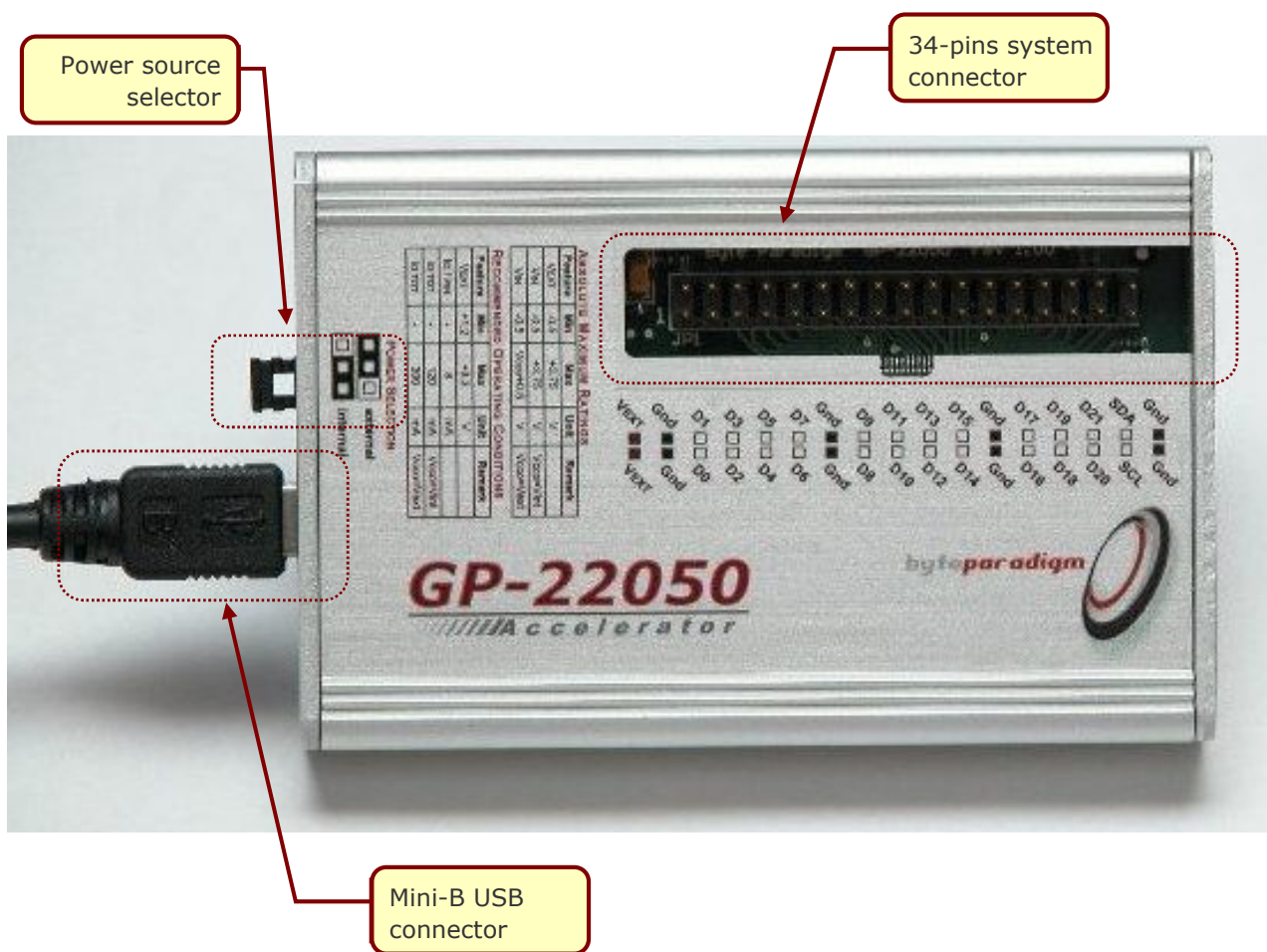
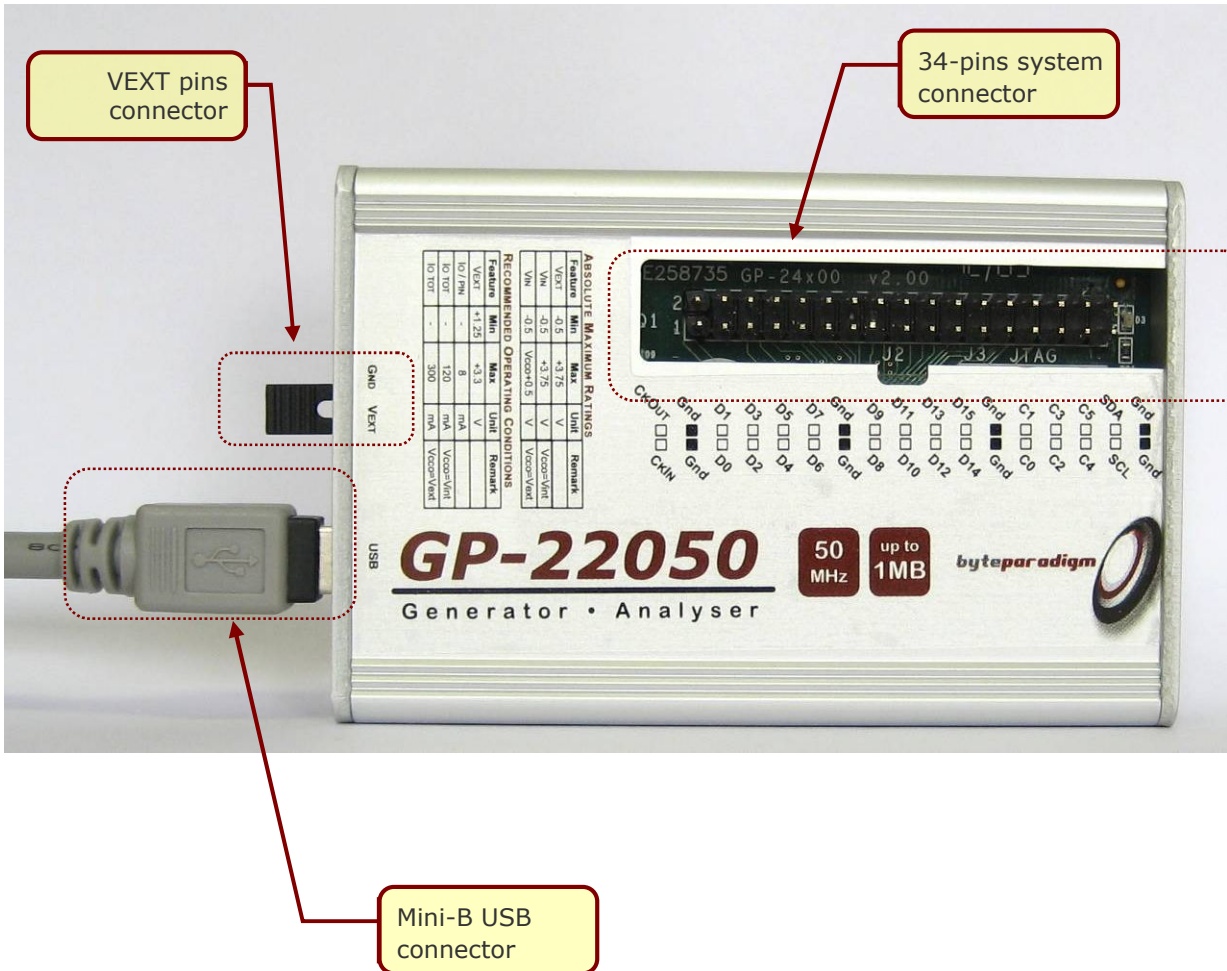


Figure 3: GP-22050 Top View – hardware revision starting with 02 or 03





The table below shows the front labels of the GP / Xpress devices according to their hardware revision.

Hardware revision starting with 01	Hardware revision starting with 02 or 03
<p>GP-22050 Accelerator</p> <p>GP-22050 Generator • Analyser</p> <p>50 MHz up to 1MB</p>	<p>GP-22050 Generator • Analyser</p> <p>50 MHz up to 1MB</p>
<p>SPI Xpress Master • Analyser</p>	<p>SPI Xpress Master • Analyser</p>
<p>Wave Xpress Generator</p>	<p>Wave Xpress Generator</p>
<p>I²C Xpress Master • Analyser</p>	<p>I²C Xpress Master • Analyser</p>
<p>GP-24100 Generator • Analyser</p> <p>100 MHz 8-32 MB</p>	<p>GP-24100 Generator • Analyser</p> <p>100 MHz 8-32 MB</p>



3.3.2 To the System under Test

The GP or Xpress device can be connected to the system under test using its 34-pin system connector (refer to [1], [5], [6] or [7] for a complete description of the GP or Xpress device system interface).

The following rules have to be followed to correctly and safely connect the GP or Xpress device to the system under test.

- ▶ When establishing or changing the connections between the GP or Xpress device and the target system, both devices have to be powered off.
- ▶ Always start to connect the reference ground pins first. To ensure better signal quality, always try to connect as many ground pins as possible. Then connect all other needed signals.
- ▶ Before powering up the system, check the position of the power source selection jumper. Be sure it corresponds to the powering scheme you want to use. When the internal power source is selected, the GP or Xpress device is powered from the USB bus. The system connector signals are then configured as +3.3V LVCMOS signals. If the external power source is selected, the user has to provide a supply voltage level chosen within the range +1.2V and +3.3V.
- ▶ When all connections are established and the power source selection is correctly set, the system can be started. The user must power up the target system first. This is especially important when external power supply is selected. Then the GP or Xpress device can be connected to the PC.

3.3.3 To the Host Computer

The GP or Xpress device can be connected to a PCB through any USB type-A connector. The device is USB 1.1 and 2.0 compatible. It supports full speed and high speed operating mode.

To connect the device to your PC, you can use the provided 2m long cable or use any other USB cable having a mini-B connector and compliant to the USB 2.0 standard.

i *When connected to a target system, the system has to be powered before connecting the GP or Xpress device to the host computer.*

The first time the device is connected to the host computer, the operating system will request a driver to be installed. They are available in the installation directory created on your computer after software and driver installation (refer to section 3.1 Driver and Software Installation”).

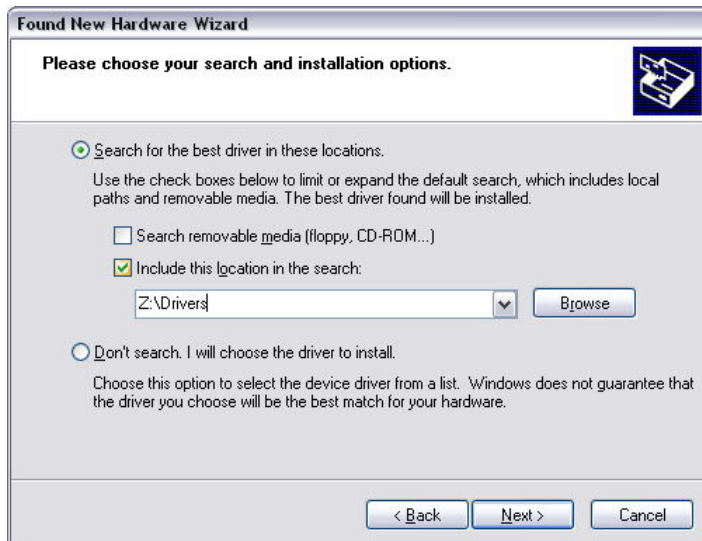
When the GP or Xpress device is plugged, the *Found New Hardware* wizard is launched by the operating system and a welcome window is opened. Select the *No, not This time* option to be able to specify the location of the driver files to the wizard and the click Next button.

Figure 4: Welcome window of the Found New Hardware wizard



You then have to specify the directory where the driver files can be found. Select the "Include this location in the search" and directly define the directory path or use the *Browse* button to navigate in your directory structure. The driver files are located in the *Drivers* directory in the installation directory used while installing the software application. When the file path is correctly defined, click the *Next* button.

Figure 5: Specify search path for driver files



After having searched for the driver files, the wizard will display a warning because the driver file is not verified. Just click on the *Continue Anyway* button to proceed.

Figure 6: Searching for driver files

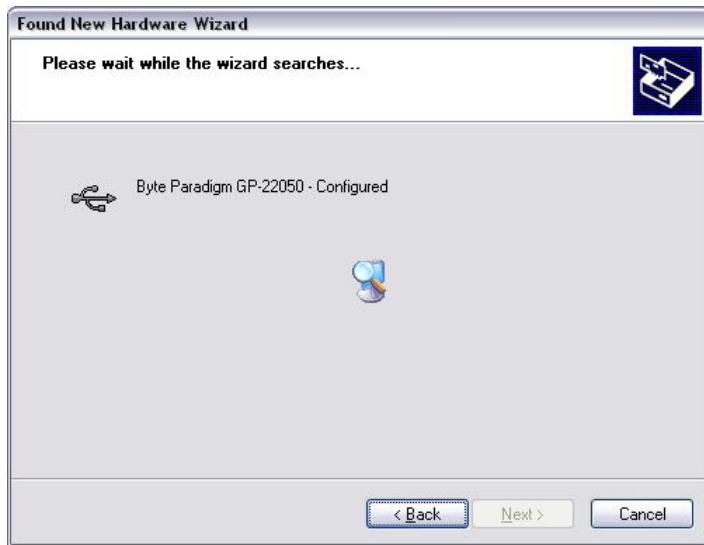
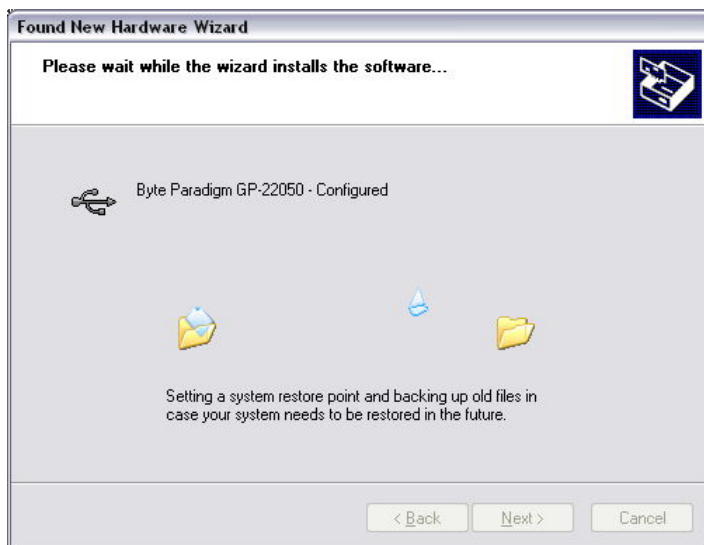


Figure 7: Driver verification warning



Figure 8: Driver files copy and installation



When all files have been successfully copied and installed, the completion window is displayed. Click the *Finish* button to close the installation wizard. The GP or Xpress device is then ready to be used.

Figure 9: Installation wizard completion



3.4 Controlling the GP or Xpress device

Your GP or Xpress device can be controlled using the following methods.

8PI CONTROL PANEL

The *8PI Control Panel* is a graphical interface provided by Byte Paradigm with the base package. It gives the user a very fast and simple way to configure and use the GP or Xpress device. The user can define all the device settings and configure the device to operate in one of the available modes.

Refer to [2] to learn how to use the *8PI Control Panel*.

TCL SCRIPTING

From the *8PI Control Panel*, the user can start a TCL interpreter. A TCL library is provided with the standard package. This library contains a set of TCL procedure giving access to all the features available in the *8PI Control Panel*. Refer to [3] for a detailed description of the TCL procedures. This TCL environment is especially useful to automate tasks and build simple applications with the GP or Xpress device.

USER APPLICATION BASED ON PROVIDED C/C++ DLL

Aside the *8PI Control Panel*, a C/C++ DLL is provided to let the user develop its own application to control the GP or Xpress device. The DLL can also be loaded in a third party application to control the GP or Xpress device. Refer to [4] for a detailed description of the C/C++ DLL.



4 Support and Feedback

For any questions related to the GP or Xpress device functionalities or usage, refer to

- ▶ the provided documentation
- ▶ Byte Paradigm web site (www.byteparadigm.com)
- ▶ or submit us your question to support@byteparadigm.com

You can also submit us all your remarks and suggestions to help us to improve the quality and the performance of the device. Please do not hesitate to contact us at support@byteparadigm.com.