



# ILDA Gem Pocket 2020 Laser projector test tool

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ILDA Gem 2020  
Laser Projector test tool



## ILDA Gem Pocket 2020

The ILDA Gem Pocket 2020 is the latest version of our popular pocket sized laser projector test tool. Using the latest digital technology the ILDA Gem Pocket will provide a long life while running from a single 9V alkaline or lithium battery and is housed in a rugged ABS housing with silicone rubber protective boot available as an optional extra.

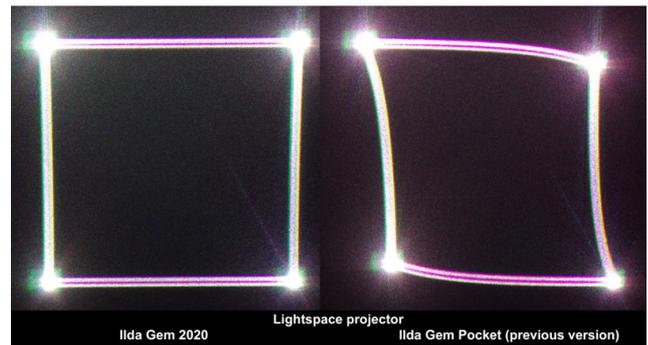
The ILDA Gem Pocket has on board quadrature pattern generator that will output a square test pattern to your scanners at one of four user selectable scan rates.

The simple controls consist of three pots and five push buttons plus three indicator LEDs. (see image left) The pots allow the colour levels to be constantly variable between 0 and 100%, and buttons are provided to switch the outputs to full power. Red green and blue LEDs are provided to indicate full power output. Other output options are orientation mode and static beam mode and centre vertical and horizontal lines (new for 2020). In addition to this there are four user selectable scan rate settings.

### What's new for the 2020 version?

Outwardly the latest version of our popular laser projector test tool shows little difference, but beneath the surface it's completely new. Though based on the same microcontroller, the entire circuit has been redesigned and has new firmware. The power supply and on/off control is all new and the RGB & XY signal outputs are now both buffered and short circuit protected. Short circuit protection is also afforded to the shutter signal line and the grounding of the device is now a genuine ground, where previously this was a virtual ground that worked well, with some projector designs it could cause a skewed output. This is no longer a problem as seen in the image (right). As well this the control pots are a higher quality for better reliability and longer life.

The new firmware also introduces a new option, allowing a single axis line in either the X or Y axis to be output.



### Operation

The ILDA Gem Pocket is a simple tool to use but we would advise that you should familiarise yourself with its controls and modes by reading this manual in full before use. If you have previously owned an ILDA GEM and are familiar with the operation then using the new one will be just the same as all the previous functions are retained and are controlled as before. The only thing you will need to learn is how to turn on the vertical or horizontal lines (see last page)

To begin, connect the 25 way sub-d female connector of the ILDA Gem Pocket to the laser projector using a 25 way ILDA standard lead, or the optional ribbon cable if purchased.

To power up the ILDA Gem Pocket simply press the power button momentarily. As the unit starts, the scanner output and colour signals will be enabled. Note if the pots are all set to zero there will be no visible output but you should be able to hear the scanners running.

The ILDA Gem Pocket will also apply a +5V signal to the ILDA shutter connection to ensure that if a shutter is in use it will be opened when the ILDA Gem Pocket is powered on.

When the power button is depressed, if the unit fails to start it normally indicates a low battery. (see power management section below)

### Normal mode

*Normal mode can be used to test the modulation of the laser modules, match several projectors to the same output size or to output a safe low power beam while aligning or adjusting a projector, all without the use of a computer and laser controller.*

Please note any button press will cause the scanner and modulation outputs to cease.

Following start-up the scanner and variable colour output will be enabled and the quadrature test pattern will output to the scanners.

The colour outputs are always set to variable levels on power up or whenever normal mode is entered. Note if the pots are all at zero the output will not be visible. Adjust the pots to the desired level and the square test pattern will be visible. The test pattern will output at approx. 50% scanner output scale set on the scanner amplifier centred about the home scanner position. You can use this to match the scale of multiple projectors.

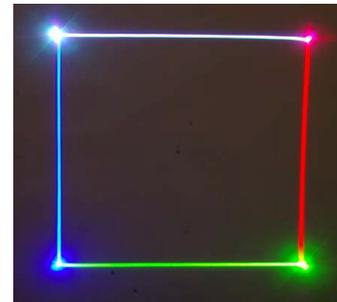
The first press of one of the coloured buttons will remove the voltage on the matching colour line turning the corresponding laser output off. A second push will turn the corresponding colour channel to full power and a third push of the same button again will return variable level output for adjustment by the pot. This cycle is repeatable on each of the three channels.

From the factory the ILDA Gem Pocket will output to the scanners at a rate of 18kpps, the scan rate can be changed at anytime by the user (see extended operation modes below).

### **Orientation mode**

*Orientation mode is used to test the output orientation of the laser projector and so is useful to allow a number of projectors to be set to a particular orientation.*

A brief press of power/option button will toggle the output between orientation and normal mode. In orientation mode the test pattern will be split into coloured bars. The position of the bars in the output will always be constant so the pattern can be used to test the output orientation of the laser projector. When viewed from behind the laser projector towards a screen the output will match the Pangolin orientation test frame when the output displays the white bar at the top and the red bar at the right with green and blue following clockwise (see image right). Pressing the power/option button once more will return the ILDA Gem Pocket to normal mode.



In orientation mode the white bar will always appear at full power but the RGB colour bars will act in the same way as in normal mode however in orientation mode the channel off function is not available.

Note. When any of the output modes is entered the colour lines are always set to variable output.

### **Selecting extended options**

*Additional options allows the ILDA Gem Pocket to provide more useful functions.*

Pressing and holding the power/option button for a few seconds will provide some more options. Entering of extended option mode is indicated by the scanner and colour output remaining ceased when the Power/Option button is released, showing that the ILDA Gem Pocket is waiting for the next button press to change the mode.

### **Static beam mode**

*Static beam mode can be used for power measurement at the laser aperture and to check & adjust the centring of the scanners.*

When in extended option mode it is possible to enable laser output but without enabling the scanner output to produce a single static beam. As this mode can be dangerous, to ensure it cannot be set accidentally you must follow the procedure below carefully. This mode should be used with care, and for safety reasons before entering this mode it is recommended to use a beam block in front of the laser under test, that can withstand the full power of the laser without over heating or failing. A black anodised heat sink is ideal for this as long as it is of suitable size for your laser power.

To enter static beam mode the power/option button must be held down for a few seconds to enter extended options mode. Upon releasing, the power/option button must be pressed and held down a second time for approx 5 seconds. As soon as the output begins the button must be released. If the power/option button remains held then the ILDA Gem Pocket will revert to normal operation with the scanner output enabled. In static beam mode pressing the coloured buttons, will, as in normal mode, cycle the colour output between variable, off and full power. Note if the pots are turned fully anti clockwise when entering static beam mode there may appear to be no laser output, therefore it is recommended that at least one pot be turned up to approx. 10-20% before entering this mode. Pressing the power/option button will exit static beam mode and return the ILDA Gem Pocket to normal mode with scanner output enabled and the colour outputs set to variable levels.

### **Changing the scanner output rate**

*Changing the scan rate can be useful to test projectors with differing specification of scanners. The test output will also indicate scanner over shoot and undershoot if incorrectly tuned.*

In extended options mode, indicated by the scanner and colour outputs being disabled, it is possible to change the scan rate of the output. To do this press one of the buttons briefly (choose the button that matches the rate you require as listed below) This sets the scan rate and the unit will store the setting in NVRAM before restarting using the new setting, so no further action is required. The scan rate can be changed as often as you need. Once in extended options mode, should you decide that you don't wish to change the scan rate simply press the power off button and the change will be cancelled. Upon the next power up the previous set scan rate will re-load.

Red button will set the output to 12kpps  
Green button will set the output to 24kpps

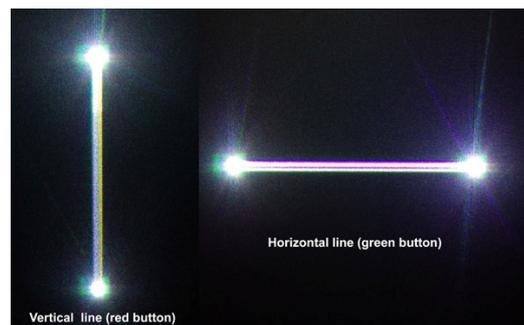
Blue button will set the output to 30kpps  
Power/option button will set the output to the default of 18kpps

### **Output of a single axis line**

*This mode will display a centred single axis line in either X or Y axis.*

To get a single axis output, enter extended options mode by pressing and holding the Power/Option button. Now press and hold the Power/Option button, and while its pressed briefly push either the red (for vertical) or green (for horizontal) button then release the Power/Option button and the single line will be displayed. To exit press the Power/Option button to return to normal or orientation mode.

You must exit from displaying one single axis line, back to normal or orientation mode before you can switch to the other single axis line. In this mode the buttons and pots will act as they do in Normal mode in that you can adjust the levels or turn each colour to full power or to off.



### **Power management**

*Long battery life is important, so as well as being economical on battery power and having an auto power feature, power management features ensure 5V output can be maintained on the colour lines. The ILDA Gem Pocket has sophisticated power management to provide good performance in all of these aspects.*

A brief press of the off button will close the ILDA Gem Pocket. The ILDA Gem Pocket uses low power circuitry to maintain long battery life and includes an auto power down feature which will automatically turn off the unit to conserve battery power after operating for approximately 10 mins. without any button being pressed.

To ensure that the output of the colour lines are maintained at a full 5v a battery monitoring circuit will prevent the ILDA Gem Pocket from starting if the battery voltage is too low to achieve 5v output. Therefore upon pressing the power button to turn the unit on, if there is no output then it is recommended to replace the battery.

Any 9v PP3 battery will work but for long life an alkaline or lithium battery is advised. Rechargeable Ni-Cd or Ni-Mh types can be used but bear in mind they do not retain power well when stored, so you may come to use your ILDA Gem Pocket to find the battery depleted and therefore unable to start.

### **Automatic power off (APO)**

*To save the battery the ILDA Gem has an APO feature which can be disabled.*

If the ILDA Gem is started with a short press of the power button it will power up and operate as normal and will self power down after 10min of no button press. If you wish to disable this feature, simply power up by pressing and holding the power button for more than 1 second. This will turn off the APO for this session only, so next time you power up it will have an active APO (unless you start with a long press of the power button)

### **Changing the battery**

Remove the protective rubber boot (if fitted) and slide off the battery cover at the lower end of the unit on the underside opposite the DB25 connector. Remove the old battery and replace with a PP3 alkaline or Lithium type. Ensure the battery clip is attached firmly and stow the battery in the compartment before replacing the cover and protective rubber boot.

### **Specifications**

Power source PP3 9V battery (supplied) Alkaline or Lithium recommended

Automatic power off time 10mins (aprox)

Current drain 22mA max (all LEDS lit) 15mA nominal

Colour Outputs red green and blue channels at variable, off or 5 V level (user selectable)

Colour signal output voltage (full power output selected) 5.02V max 4.80V min (depending on battery condition)

Scanner output quadrature test pattern at 12, 18, 24 & 30kpps (+/-10%)

Orientation output white at the top with red green and blue in clockwise direction indicating projector configured as per Pangolin orientation test frame.

Shutter and Colour outputs are buffered & short circuit protected.

Scanner output 5V peak to peak differential (50% of ILDA max scale signal)

Dimensions 117.5mm x 72.4mm x 25.4mm

Weight 170g with battery or 220g with battery & rubber boot

### **Available accessories**

Rubber protective boot in red black or blue

Dedicated ILDA Gem breakout board for use if you need to use the ILDA Gem signals for other purposes

30cm 25way M to 25way F ILDA ribbon lead