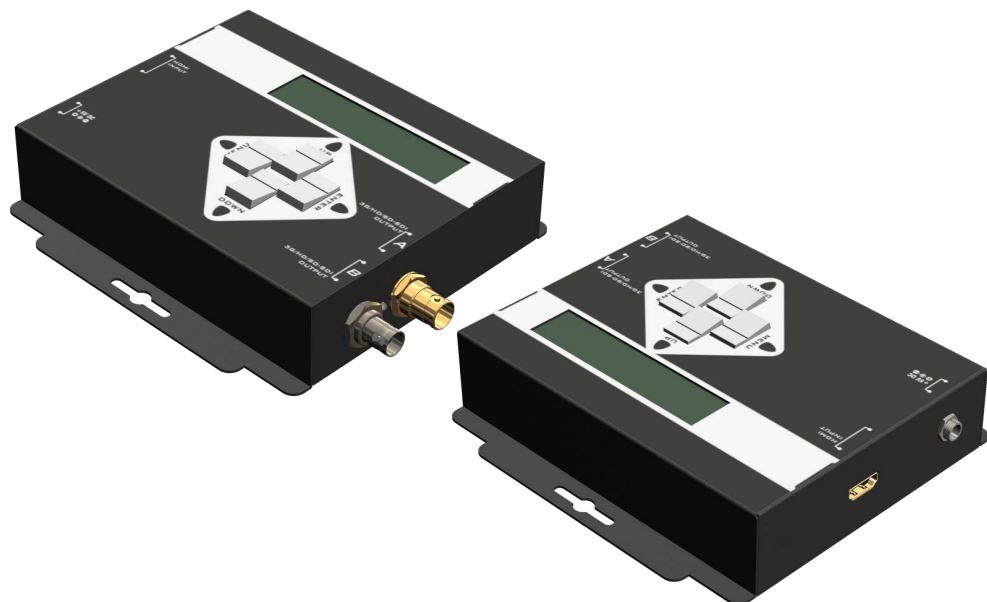


# PG-303

## 3G/HD/SD-SDI Pattern Generator

### User Manual



**3G HD SD**



rev: 161219  
Made in Taiwan



### **Safety and Notice**

The **PG-303 3G/HD/SD-SDI Pattern Generator** has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the **PG-303** should be used with care. Please read and follow the safety instructions to protect yourself from possible injury and to minimize the risk of damage to the unit.

- Follow all instructions and warnings marked on this unit.
- Do not attempt to service this unit yourself, except where explained in this manual.
- Provide proper ventilation and air circulation and do not use near water.
- Keep objects that might damage the device and assure that the placement of this unit is on a stable surface.
- Use only the power adapter and power cords and connection cables designed for this unit.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.



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# INTRODUCTION

The **PG-303 3G/HD/SD-SDI Pattern Generator** is an advanced SDI pattern generator with multi-format (3G/HD/SD) and multi-pattern support. Besides still and moving video test patterns, other features such as audio (SMPTE-291M) are also provided. PG-303 can support up to 8 channel AES compliant audio with 48KHz sample rate. Another attractive feature of PG-303 comes from bypassing HDMI input and allows users with more testing patterns for connected display or treats PG-303 as an advanced HDMI to SDI converter with 3G capability. With portable size, PG-303 is equipped four buttons and LCM screen to ease the control. This device provides a cost effective way to calibrate and test SDI enable video devices and displays.

## FEATURES

- Supported output resolution**  
 NTSC 525@60, PAL 625@50, 720p@23.98, 720p@50, 720p@59.94, 720p@60, 1080i@50, 1080i@59.94, 1080i@60, 1080p@23.97, 1080p@24, 1080p@25, 1080p@29.97, 1080p@30, 1080p@50, 1080p@59.94, 1080p@60  
 Bit Rate: 2.97 Gbps, 2.967 Gbps, 1.485 Gbps, 1.4835 Gbps, 270 Mbps  
 Resolution: 10bit
- Video Patterns**  
 100% Color Bars, Borderline, Random Noise, Check Field, Black, Vertical Lines, Black / White alternate fields, Full Grey / Full White, Black to White Gradient, Random Generator for all still patterns, moving squares White noise, Inverse effect with still pattern, Scrolling Title (see Appendix for illustrations)
- Save Settings to Memory Option**
- ANC Data**  
 EDH (RP-165), SMPTE 352M, SMPTE291M
- Control**  
 By LCM or panel buttons
- Video Output**  
 Triple SDI output (SDI, HD-SDI, 3G-SDI)

## PACKAGE CONTENTS

- 1x PG-303
- 1x 5V power supply unit
- 1x User Manual

# SPECIFICATIONS

| Model Name                                       | PG-302  | PG-303  |
|--|---|---|
| <b>Technical</b>                                 |   |   |
| Role of usage                                    | Pattern generator   |   |
| SDI standards                                    | HD/SD-SDI   | 3G/HD/SD-SDI  |
| Auto SDI rate detection                          | Yes   |   |
| Supported protocols                              | SMPTE 259M (270Mbps / 360Mbps)<br>SMPTE 292M / HDTV (1.485 & 1.485/1.001Gbps)                       | SMPTE 259M (270Mbps / 360Mbps)<br>SMPTE 292M / HDTV (1.485 & 1.485/1.001Gbps)<br>SMPTE 424/425M (2.97 & 2.97/1.001Gbps)               |
| Video bandwidth                                  | 1.485Gpbs   | 2.97Gpbs  |
| Data rates                                       | 143 / 270 / 1483 / 1485 Mbps  | 143 / 270 / 1483 / 1485 / 2967 / 2970 Mbps  |
| Video support                                    | [HD] 720p50/59.94/60, 1080p24/30, 1035i50/59.94/60, 1080i50/59.94/60<br>[SD] NTSC@59.94Hz, PAL@50Hz | [3G] 1080p@50/59.94/60 (4:2:2)<br>[HD] 720p50/59.94/60, 1080p24/30, 1035i50/59.94/60, 1080i50/59.94/60<br>[SD] NTSC@59.94Hz, PAL@50Hz |
| SDI signal type                                  | SMPTE-292M / 259M   | SMPTE-292M / 259M / 424M  |
| HDMI bypass                                      | Yes   |   |
| Output impedance                                 | 75Ω   |   |
| Cable (Belden 1694A) equalization / transmission | [3G-SDI] up to 60m (190ft) / [HD-SDI] up to 150m (500ft) / [SD-SDI] up to 300m (1000ft)             |   |
| Audio support                                    | Yes   |   |
| PCB Stack-up                                     | 4-layer board [impedance control — differential 100Ω; single 50Ω]                                   |   |
| Input  | 1x HDMI   |   |
| Output   | 2x BNC [SDI]  |   |
| BNC connector                                    | 75Ω interlocking socket   |   |
| HDMI connector                                   | Type A [19-pin female]  |   |
| [HD] Eye pattern characteristics                 | Amplitude: Within 800mV <10%<br>Rise overshoot: Less than 2%<br>Fall overshoot: Less than 2%        | Long time jitter <1.0 UI<br>Timing jitter <1.0 UI<br>Alignment jitter <0.2 UI   |
| <b>Mechanical</b>                                |   |   |
| Housing  | Metal enclosure   |   |
| Dimensions [L x W x H]                           | Model   | 150 x 190 x 32mm [5.9" x 7.5" x 1.3"]   |
|  | Package   | 175 x 270 x 100mm [6.9" x 10.6" x 3.9"]   |
|  | Carton  | 450 x 370 x 300mm [1'6" x 1'3" x 1']  |
| Weight   | Model   | 660g [1.5 lbs]  |
|  | Package   | 1260g [2.8 lbs]   |
| Fixedness  | Interlocking power supply   |   |
| Power supply                                     | 5V 4A DC  |   |
| Power consumption                                | 10 Watts [max]  |   |
| Operation temperature                            | 0~40°C [32~104°F]   |   |
| Storage temperature                              | -20~60°C [-4~140°F]   |   |
| Relative humidity                                | 20~90% RH [no condensation]   |   |

# MENU OPERATION

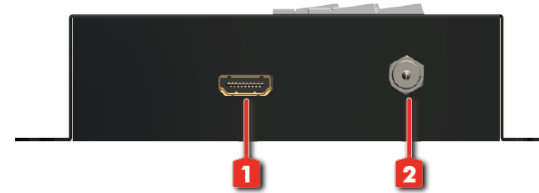
| Menu      | Items      |                 |
|-----------|------------|-----------------|
| 01 Format | Resolution | NTSC            |
|           |            | PAL             |
|           |            | 720p            |
|           |            | 1080p           |
|           |            | 1080i           |
|           | Frequency  | 60              |
|           |            | 59.94           |
|           |            | 50              |
|           |            | 30              |
|           |            | 29.97           |
|           |            | 25              |
|           |            | 24              |
|           |            | 23.98           |
|           |            | PsF25           |
|           |            | PsF29.97        |
|           |            | PsF30           |
|           |            | Output          |
| 02 Video  | Patterns   | SMPTE Bar       |
|           |            | 100% Color Bar  |
|           |            | 75% Color Bar   |
|           |            | Check Field     |
|           |            | Gradient B→R(H) |
|           |            | Gradient B→G(H) |
|           |            | Gradient B→B(H) |
|           |            | Gradient R→B(H) |
|           |            | Gradient G→B(H) |
|           |            | Gradient B→B(H) |
|           |            | Gradient B→R(V) |
|           |            | Gradient B→G(V) |
|           |            | Gradient B→B(V) |
|           |            | Gradient R→B(V) |
|           |            | Gradient G→B(V) |
|           |            | Gradient B→B(V) |
|           |            | Red Level B→R   |
|           |            | Red Level R→B   |
|           |            | Green Level G→B |
|           |            | Green Level B→G |

| Menu     | Items    |                |          |
|----------|----------|----------------|----------|
| 02 Video | Patterns | Blue Level B→B |          |
|          |          | Blue Level B→B |          |
|          |          | Gra Level W→B  |          |
|          |          | Gra Level B→W  |          |
|          |          | Black Level    |          |
|          |          | White Level    |          |
|          |          | 100% Red       |          |
|          |          | 100% Green     |          |
|          |          | 100% Blue      |          |
|          |          | 100% White     |          |
|          |          | 70% Gray       |          |
|          |          | 40% Gray       |          |
|          |          | Black          |          |
|          |          | Circle 1       |          |
|          |          | Circle 2       |          |
|          |          | Moire          |          |
|          |          | H Stripe R     |          |
|          |          | H Stripe G     |          |
|          |          | H Stripe B     |          |
|          |          | V Stripe R     |          |
|          |          | V Stripe G     |          |
|          |          | V Stripe B     |          |
|          |          | Sequence       |          |
|          |          | Multi-Burst    |          |
|          |          | HDMI Bypass    |          |
|          |          | CZP/Prog. Only |          |
|          |          | EQ             |          |
|          |          | PLL            |          |
|          |          | Text           | Off      |
|          |          |                | On-White |
|          |          |                | On-Black |
|          |          | Timer          | On-Gray  |
|          |          |                | Off      |
|          |          | Data Filter    | On-W/B   |
|          |          |                | On-B/W   |
|          | On       |                |          |
|          | Off      |                |          |

| Menu              | Items      |            |
|-------------------|------------|------------|
| 03 Audio          | Mode       | Off        |
|                   |            | On         |
|                   | Group      | 1+2        |
|                   |            | 3+4        |
|                   | Level      | 0dB        |
|                   |            | -6dB       |
|                   |            | -12dB      |
|                   |            | -18dB      |
|                   |            | -24dB      |
|                   |            | -30dB      |
|                   |            | -36dB      |
|                   |            | -42dB      |
|                   |            | Silence    |
|                   |            | Random     |
|                   | Mask       | Off        |
|                   |            | CH 1234    |
|                   |            | CH 1       |
|                   |            | CH 2       |
|                   |            | CH 3       |
|                   |            | CH 4       |
| CH 1+2            |            |            |
| CH 3+4            |            |            |
| 04 Motion         | Motion     | No Motion  |
|                   |            | Square 1   |
|                   |            | Square 2   |
|                   |            | 2 Squares  |
|                   |            | Square Inv |
|                   | Data Speed | 1          |
|                   |            | 2          |
|                   |            | 3          |
|                   |            | 4          |
|                   |            | 5          |
| 6                 |            |            |
| 7                 |            |            |
| 8                 |            |            |
| 05 ANC Data       | SMPTE-352M | Off        |
|                   |            | On         |
|                   | CC         | On         |
|                   | CRC        | Off        |
| Line number       | On         |            |
|                   | Off        |            |
| 06 WINDOW PAT SET | Window     | Gray       |
|                   |            | Red        |
|                   |            | Green      |
|                   |            | Blue       |
|                   |            | Cyan       |
|                   |            | Magenta    |
| Yellow            |            |            |
| Level             | 0%~100%    |            |
| Window Field      | 1~20       |            |
| 07 System         | Status     | No Change  |
|                   |            | Factory    |
|                   | Version    | Now Save   |
|                   |            | V1.05      |

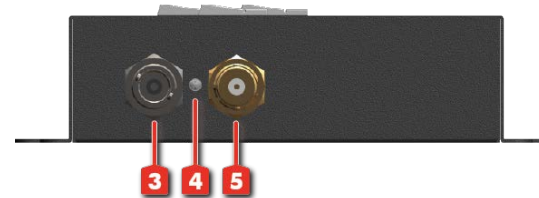
## PANEL DESCRIPTIONS

### Front Panel



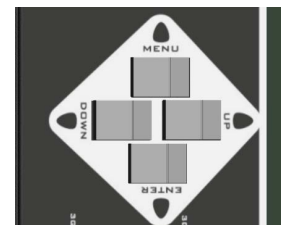
- HDMI INPUT:** Plug in a HDMI cable to be linked to a HDMI source
- +5V DC:** Connect to a 5V DC power supply unit

### Rear Panel



- SDI OUTPUT A:** Connect to a SDI device for SDI, HD-SDI, or 3G-SDI signal output either from the chosen pattern or the converted HDMI source signal
- Lock LED:** showing if the audio/video signal existed or not
- SDI OUTPUT B:** Connect to a SDI device for SDI, HD-SDI, 3G-SDI signal output either from the chosen pattern or the converted HDMI source signal

### Top View



| Button | Function                   |
|--------|----------------------------|
| Menu   | Trigger the menu operation |
| Enter  | Enter the menu item        |
| Up     | Choose the last menu item  |
| Down   | Choose the next menu item  |

# DIP SWITCH



A 4-pin DIP switch is used for user interface, and users can access this switch from the bottom of the unit.

| Pin No. | 1                  | 2          | 3          | 4            |
|---------|--------------------|------------|------------|--------------|
| ON (↑)  | Used for SMPTE352M | 3G level B | Not in use | Update EDID  |
| OFF (↓) |                    | 3G level A | Not in use | Default EDID |



Factory default for 4-pin DIP switch: OFF-OFF-OFF-OFF [↓-↓-↓-↓]  
In order to keep the compatibility of HDMI to most monitors, PG-303 features EDID learning ability. The operation is shown in the EDID learning section.

# EDID LEARNING

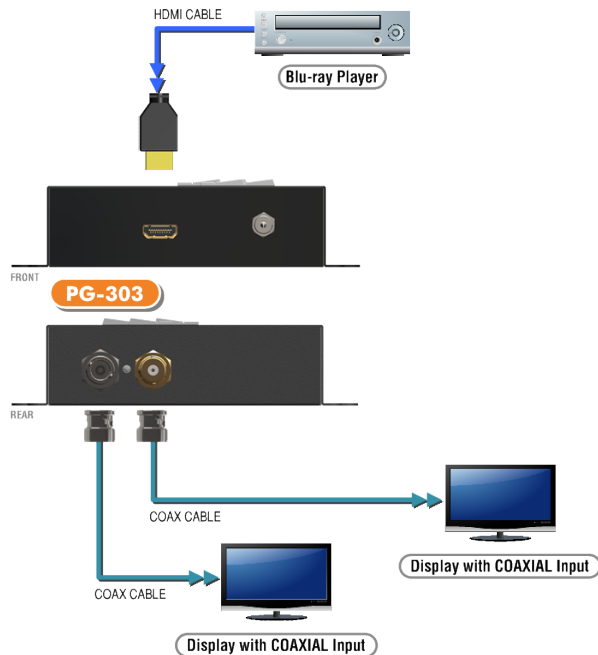
1. Turn off PG-303 and set the pin 4 of DIP switch of PG-303 to OFF [□].
2. Connect the HDTV to the HDMI port on the PG-303, and then turn on VPG-SDI3.
3. The Lock LED on the PG-303 will dim and light again, which indicates the EDID learning process is done.
4. Connect PG-303 to the HDMI source through a HDMI cable and enjoy the experience.

# NOTICE

1. In HDMI bypass mode, users must be aware of that the jitters coming from HDMI sources, such as DVD players, may be much higher than typical requirement according to SMPTE request on HD-SDI signals. This will result in SDI output with high jitters or even no SDI outputs!
2. Due to the high frequency bandwidth and low jitter requirement of 3G-SDI signals, it is strongly recommended to use just one SDI OUTPUT with one 75 ohm.
3. The features including new timings and patterns may increase without notice after the firmware is updated! This may affect the menu items, but will keep the same framework for users!

# CONNECTION DIAGRAM

- COAXIAL
- HDMI



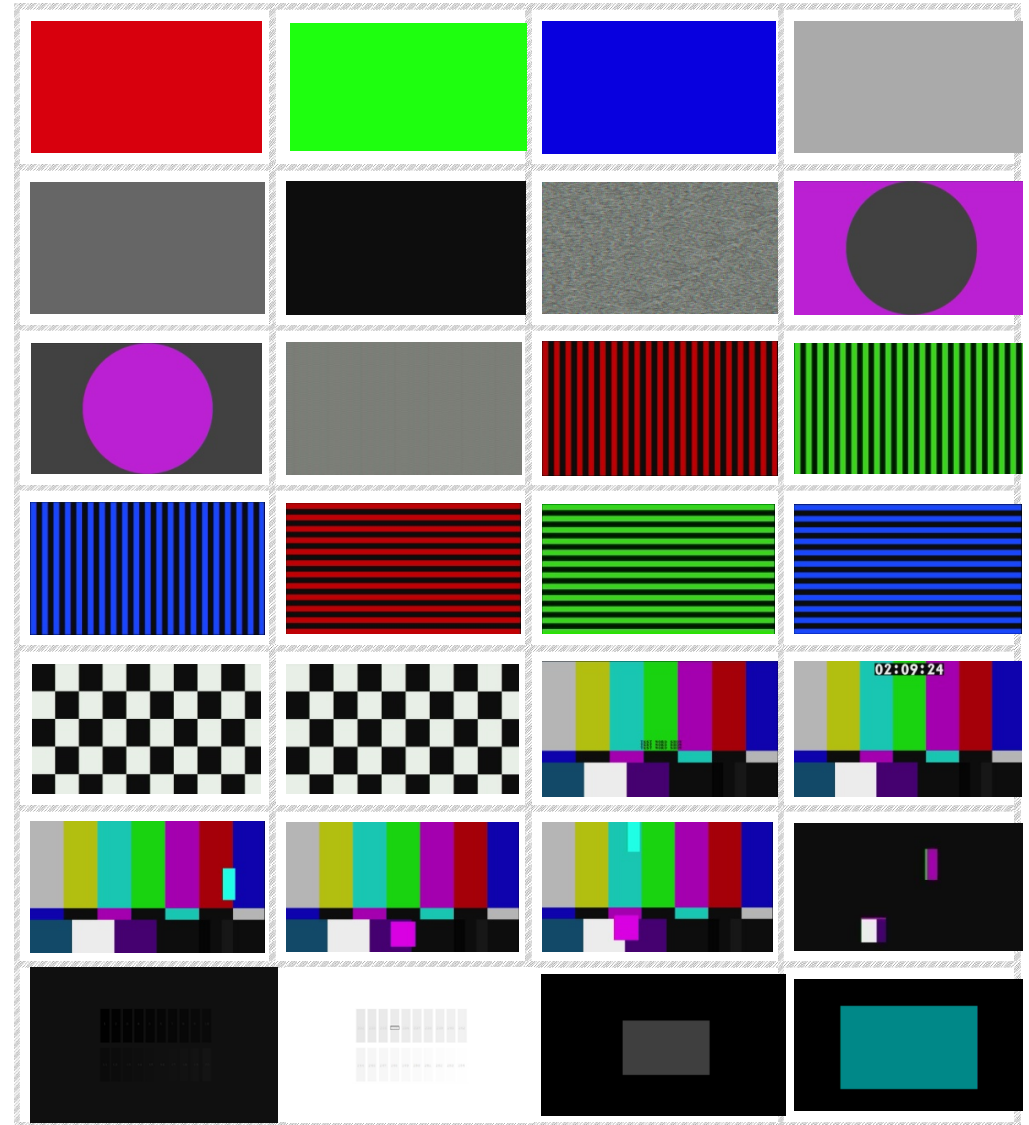
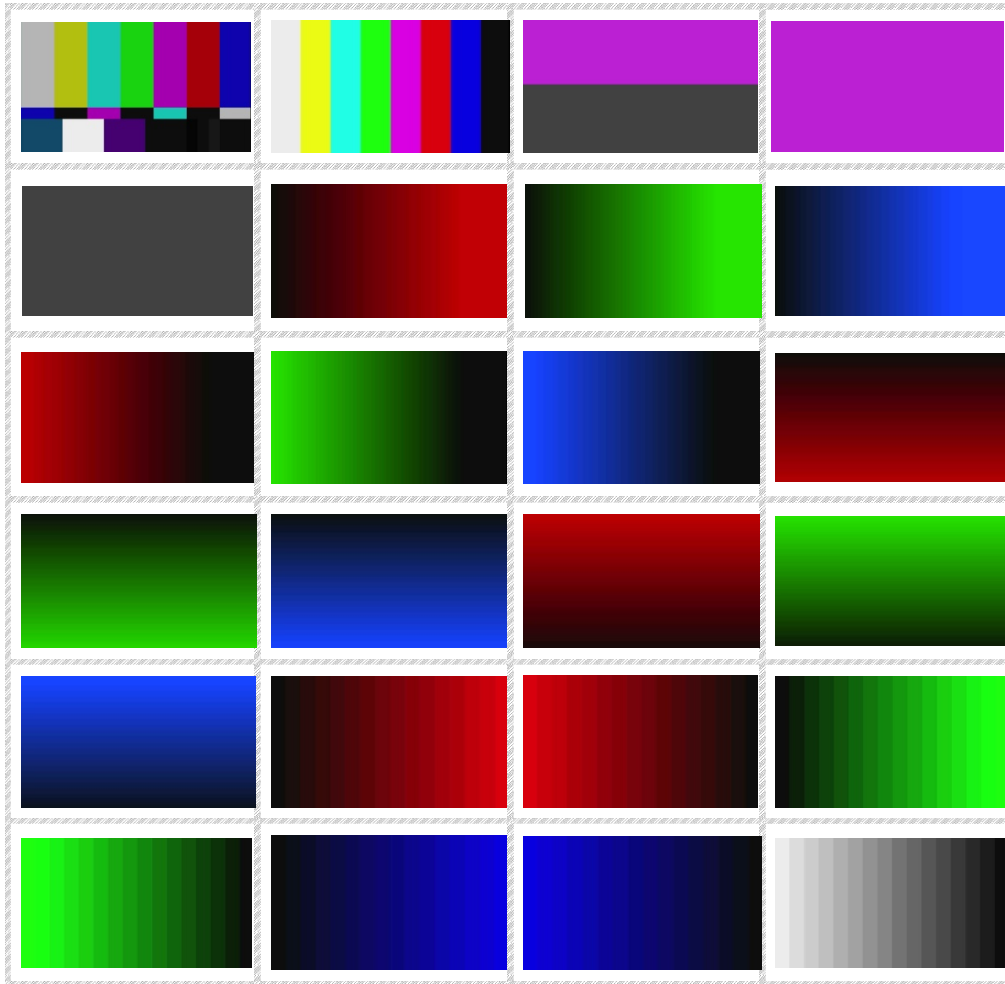
# APPENDIX

- Data Identification Word of Ancillary Data Packet

| ANC Data    | DID  | SDID/DBN |
|-------------|------|----------|
| 352M        | 0x41 | 0x01     |
| RP-165-EDH* | 0xF4 | 0x00     |

\* Data Type 1(SMPTE-291M)

- Built-in Video Patterns



# WARRANTY

The SELLER warrants the **PG-303 3G/HD/SD-SDI Pattern Generator** to be free from defects in the material and workmanship for 1 year from the date of purchase from the SELLER or an authorized dealer. Should this product fail to be in good working order within 1 year warranty period, The SELLER, at its option, repair or replace the unit, provided that the unit has not been subjected to accident, disaster, abuse or any unauthorized modifications including static discharge and power surges.

Unit that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for 90 days from the day of reshipment to the BUYER. If the unit is delivered by mail, customers agree to insure the unit or assume the risk of loss or damage in transit. Under no circumstances will a unit be accepted without a return authorization number.

The warranty is in lieu of all other warranties expressed or implied, including without limitations, any other implied warranty or fitness or merchantability for any particular purpose, all of which are expressly disclaimed.

Proof of sale may be required in order to claim warranty. Customers outside Taiwan are responsible for shipping charges to and from the SELLER. Cables are limited to a 30 day warranty and cable must be free from any markings, scratches, and neatly coiled.

The content of this manual has been carefully checked and is believed to be accurate. However, The SELLER assumes no responsibility for any inaccuracies that may be contained in this manual. The SELLER will NOT be liable for direct, indirect, incidental, special, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. **Also, the technical information contained herein regarding the PG-303 features and specifications is subject to change without further notice.**