

# PGY-SMBus

## Exerciser and Protocol Analyzer



SMBus Serial bus interface has been widely used for voltage and temperature monitoring of the system.

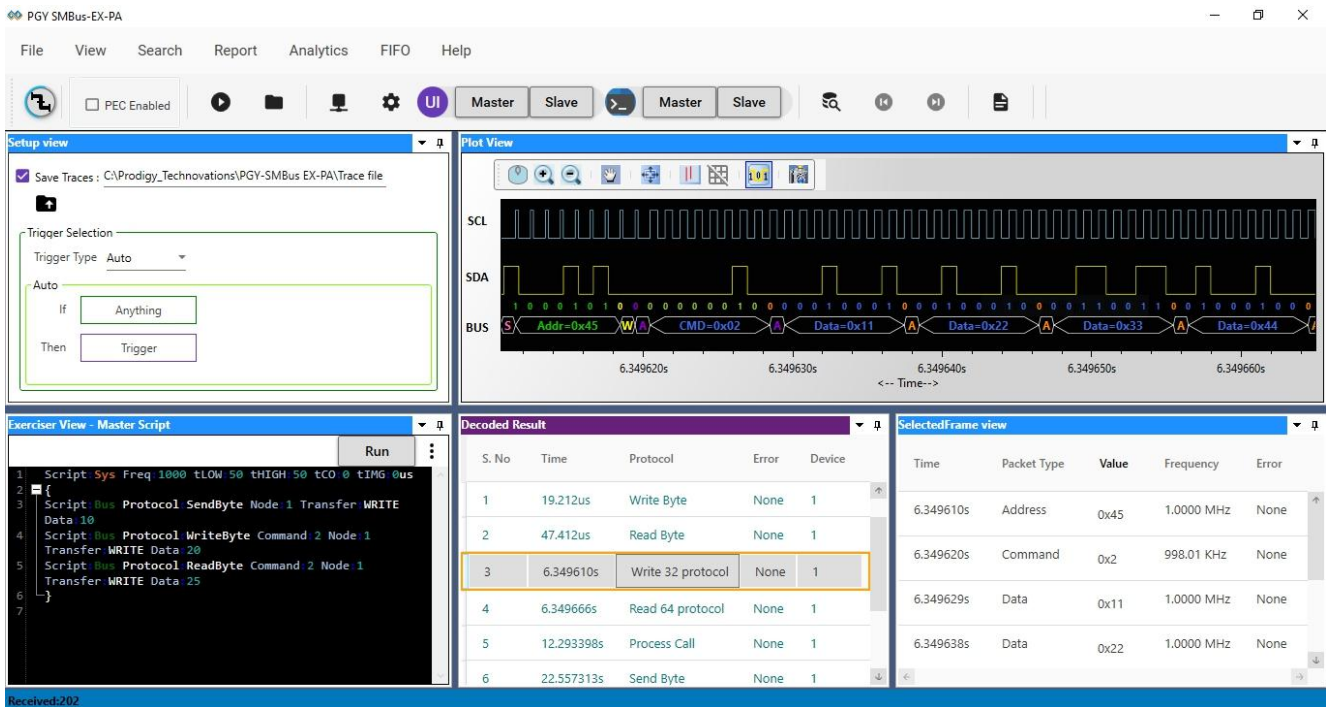
PGY-SMBus-EX-PD is the leading instrument that enables the design and test engineers to test the SM Bus designs for its specifications by configuring PGY-SMBus-EX-PD as master/slave, generating SM Bus traffic with error injection capability and decoding SM bus Protocol decode packets.

### Key Features

- ✦ Supports SMBus 3.4Mbps Speed.
- ✦ Ability to configure it as Master or Slave.
- ✦ Simultaneously generate SMBus traffic and Protocol decode of the Bus.
- ✦ SMBus Master and Slaves.
- ✦ Error Injection ACK/NACK errors.
- ✦ Variable SMBus data speeds and duty cycle.
- ✦ Continuous streaming of protocol data to host computer to provide a large buffer.
- ✦ Timing diagram of Protocol decoded bus.
- ✦ Listing view of Protocol activity.
- ✦ Error Analysis in Protocol Decode.
- ✦ Ability to write exerciser script to combine multiple data frame generation at different data speeds.
- ✦ USB 2.0/3.0 host computer interface.
- ✦ API support for automation in python or C++.



## Multi-Domain View



The screenshot displays the PGY SMBus-EX-PA software interface with the following components:

- Setup view:** Includes a 'Save Traces' checkbox and a 'Trigger Selection' section with 'Trigger Type' set to 'Auto' and a trigger condition 'If Anything Then Trigger'.
- Plot View:** Shows a timing diagram for SCL, SDA, and BUS signals. The BUS signal is decoded with labels: 'Addr=0x45', 'CMD=0x02', 'Data=0x11', 'Data=0x22', 'Data=0x33', and 'Data=0x44'.
- Exerciser View - Master Script:** Contains a script for generating SMBus traffic:
 

```

      1 Script Sys Freq 1000 tLOW 50 tHIGH 50 tCO 0 tIMG 0us
      2 {
      3   Script Bus Protocol SendByte Node 1 Transfer WRITE
      4   Data 10
      5   Script Bus Protocol WriteByte Command 2 Node 1
      6   Transfer WRITE Data 20
      7   Script Bus Protocol ReadByte Command 2 Node 1
      8   Transfer WRITE Data 25
      9 }
      
```
- Decoded Result:** A table showing protocol activity:
 

S.No	Time	Protocol	Error	Device
1	19.212us	Write Byte	None	1
2	47.412us	Read Byte	None	1
3	6.349610s	Write 32 protocol	None	1
4	6.349666s	Read 64 protocol	None	1
5	12.293398s	Process Call	None	1
6	22.557313s	Send Byte	None	1
- SelectedFrame view:** A table showing details for selected frames:
 

Time	Packet Type	Value	Frequency	Error
6.349610s	Address	0x45	1.0000 MHz	None
6.349620s	Command	0x2	998.01 KHz	None
6.349629s	Data	0x11	1.0000 MHz	None
6.349638s	Data	0x22	1.0000 MHz	None

Multi-Domain View provides the complete view of SMBus Protocol activity in a single GUI. Users can easily setup the analyzer to generate SMBus traffic using a GUI or script. Users can set different trigger conditions from the setup menu to capture Protocol activity at specific events and decode the transition between Master and Slave. The decoded results can be viewed in the timing diagram and Protocol listing window with auto correlation. This comprehensive view of information makes it industry's best, offering an easy to use solution to debug the SMBus protocol activity.

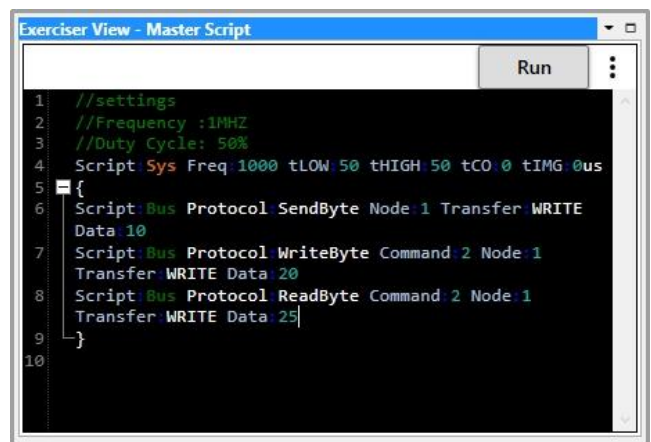
## Exerciser



The 'Exerciser View - Bus Configuration' window shows the following settings:

- Node Type: SMBus\_Master
- Interface: Internal
- Termination: ON
- Voltage(V): 3.3

Buttons: View Registers, Add Device



The 'Exerciser View - Master Script' window shows a script for generating SMBus traffic:

```

  1 //settings
  2 //Frequency :1MHZ
  3 //Duty Cycle: 50%
  4 Script Sys Freq 1000 tLOW 50 tHIGH 50 tCO 0 tIMG 0us
  5 {
  6   Script:Bus Protocol SendByte Node 1 Transfer WRITE
  7   Data 10
  8   Script:Bus Protocol WriteByte Command 2 Node 1
  9   Transfer WRITE Data 20
 10  Script:Bus Protocol ReadByte Command 2 Node 1
 11  Transfer WRITE Data 25
 12 }
  
```

PGY-SMBus-EX-PD supports SMBus traffic generation using GUI and Script. Users can generate simple traffic generation using the GUI to test the DUT. Script based GUI provides flexibility to emulate the complete expected traffic in real world including error injections. In this sample script user can generate SMBus traffic as below :

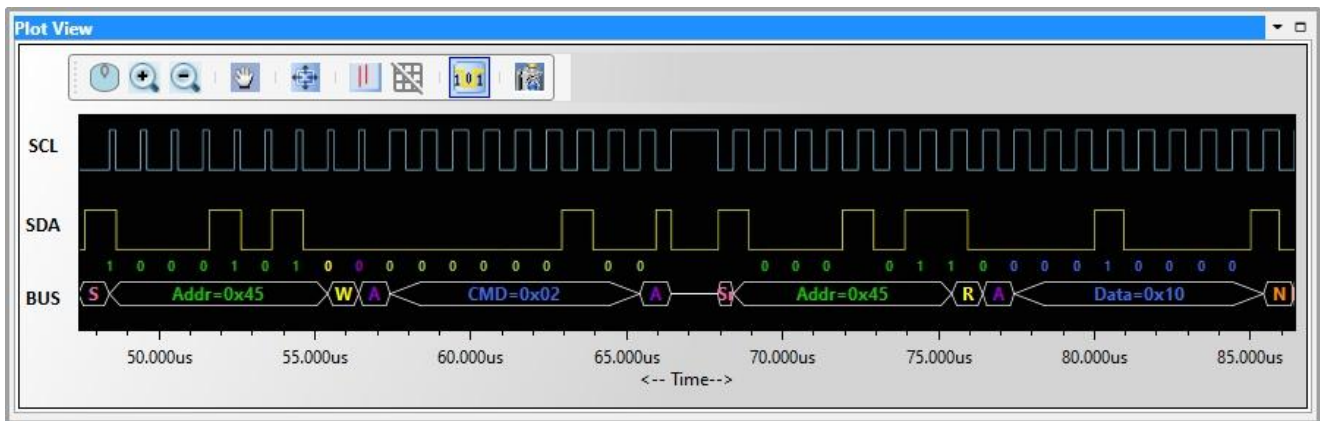
Script line #4: Set system Frequency 1MHz, Duty cycle to 50%, CLK to data delay to Ons, system inter message gap to 0us

Script line #6: SendByte

Script line #7: WriteByte

Script line #8: ReadByte

## Timing Diagram and Protocol Listing View



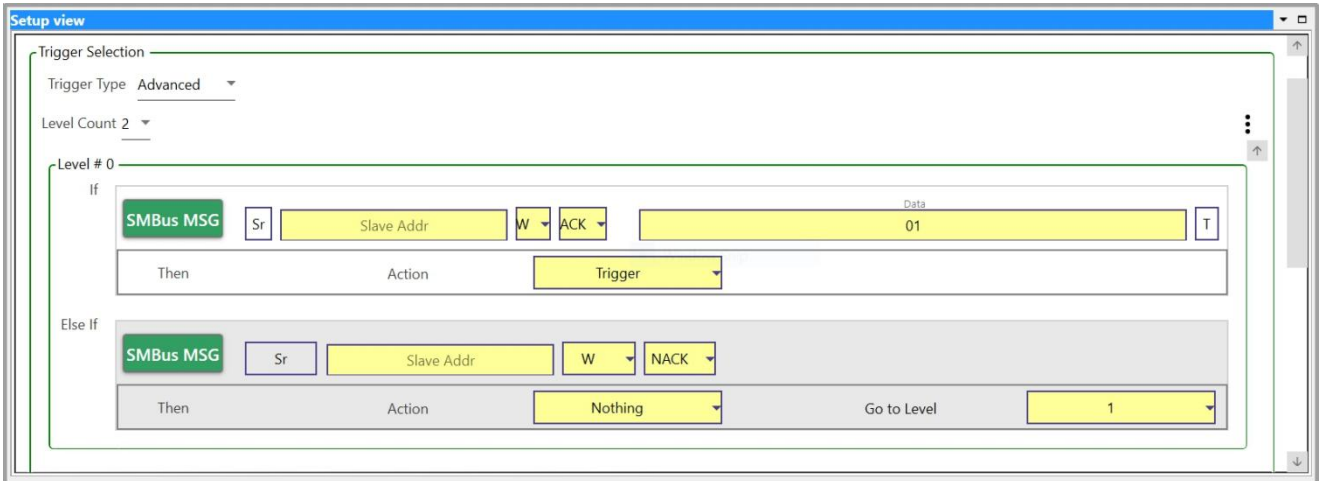
The timing view provides the plot of SCL and SDA signals with a bus diagram. Overlaying of Protocol bits on the digital timing waveform will help easy debugging of the protocol decoded data. Cursor and Zoom features will make it convenient to analyze Protocol in the timing diagram for any timing errors.

Decoded Result					SelectedFrame view				
S. No	Time	Protocol	Error	Device	Time	Packet Type	Value	Frequency	Error
0	12.000ns	Send Byte	None	1	47.412us	Address	0x45	1.0001 MHz	None
1	19.212us	Write Byte	None	1	57.408us	Command	0x2	997.01 KHz	None
2	47.412us	Read Byte	None	1	67.920us	Address	0x45	1.0000 MHz	None
3	6.349610s	Write 32 protocol	None	1	77.420us	Data	0x10	1.0000 MHz	None
4	6.349666s	Read 64 protocol	None	1					
5	12.293398s	Process Call	None	1					
6	22.557313s	Send Byte	None	1					
7	22.557332s	Write Byte	None	1					
8	22.557360s	Read Byte	None	1					



Protocol window provides the decoded packet information in each state and all packet details with error info in packet. Selected frames in the Protocol listing window will be auto correlated in the timing view to view the timing information of the packet.

## Powerful Trigger Capabilities



PGY-SMBus-EX-PD supports Auto, simple and advanced trigger capabilities. Analyzer can trigger on any of the SMBus Protocol packets. Advanced Trigger provides the flexibility to monitor Multiple trigger conditions and can set multiple state trigger machines.



## PGY-SMBus-EX-PD Specifications

PGY-SMBus Specifications	Features	PGY-PMBus-EX-PD
<b>Exerciser:</b>		
Configurable	1 Master + 2 Slaves	✓
SMBus Traffic Generation	Custom SMBus traffic generation Simulate real-world network traffic	✓
SCL Frequency	100KHz to 3.4MHz	✓
Voltage Drive Level	1V to 3.3V at steps of 100mV	✓
SCL Duty Cycle variation	User-Defined	✓
SCL & SDA Delay	User-Defined	✓
Delay between two messages	User-Defined	✓
Error Injection	ACK/NACK Errors	✓
API Support	Support for Automation of operation using Python or C++.	✓
<b>Protocol Analysis:</b>		
Supports	SMBus protocol decode	✓
Protocol Views	Timing Diagram View. Protocol Listing View. Bus-Diagram to display Protocol packets with timing diagram plot.	✓
Protocol Trigger	Auto (Trigger on any packet). Simple (Trigger on user-defined SMBus packet). Advanced (Multistate & Multilevel trigger with timer capability).	✓
Protocol Error Report	ACK/NACK Errors Non-standard Frames	✓
Capture Duration	Continuous streaming Protocol Data to host HDD/SSD	✓
Host Connectivity	USB 3.0/2.0 interface	✓



## Ordering Information

PGY-SMBus-EX-PD SMBus Exerciser and Protocol Analyzer.

## Deliverables for PGY-SM bus -EX-PD

- PGY-SMBus-EX-PD Unit.
- USB3.0 cable.
- PGY-SMBus-EX-PD Software in CD.
- 12V DC adapter.
- Flying lead probe cable with female connector to connect to DUT.

## Warranty Information

Hardware Warranty - 2 years

Software and Firmware Warranty - 1 year Probes (covered under warranty for any manufacturing defect) - 6 months

## Contact Information



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## About Prodigy Technovations Pvt Ltd

Prodigy Technovations Pvt Ltd ([www.prodigytechno.com](http://www.prodigytechno.com)) is a leading global technology provider of Protocol Decode and Physical layer testing solutions on test and measurement equipment. The company's ongoing efforts include the successful implementation of innovative and comprehensive protocol decode and physical layer testing solutions that span the serial data, telecommunications, automotive, and defense electronics sectors worldwide.