PGY-RFFE-EX-PD RFFE Protocol Exerciser and Analyzer

RFFE Protocol Exerciser and Analyzer

The RF Front-end control interface (RFFE) Serial bus interface is emerging as a chosen for controlling RF front-end devices. There are variety of front-end devices such as Power Amplifiers (PA), Low-Noise Amplifiers (LNA), filters, switches, power management modules, antenna tuners. It is widely used in mobile devices.
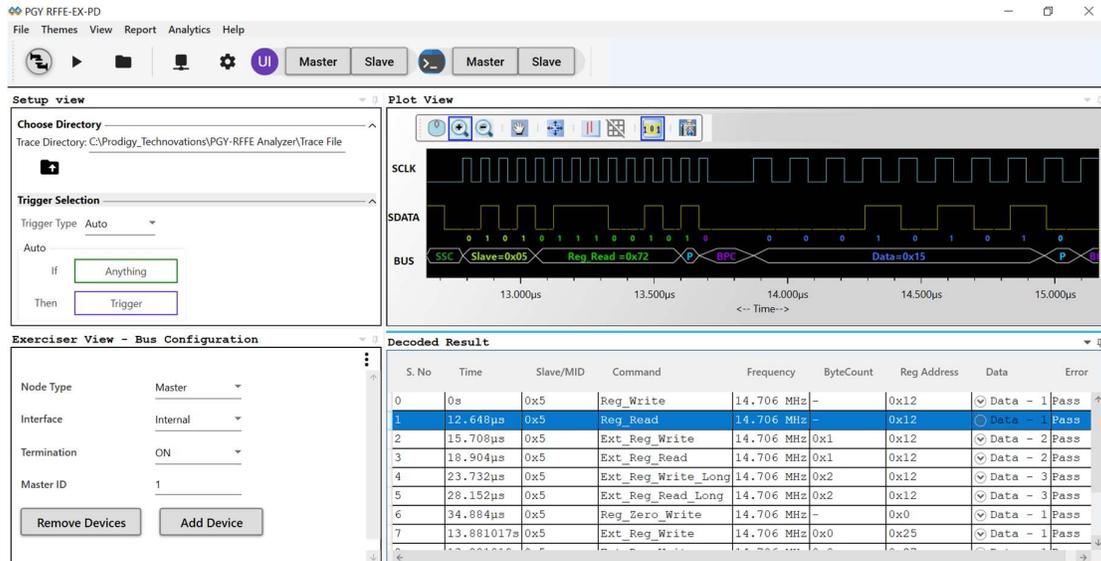
PGY-RFFE-EX-PD is the leading instrument that enables the design and test engineers to test the RFFE interface for its specifications by configuring PGY-RFFE-EX-PD as master/slave, generating RFFE traffic with error injection capability, amplitude variation and decoding RFFE Protocol decode packets.

Features:

- Supports RFFE 2.0/2.1 Specification
- Ability to configure it as Master or Slave
- Generate different RFFE traffic at full speed [1] & half speed.
- Error injection such as parity errors and NACK/ACK errors
- Variable RFFE data speeds, TCQ delay, Amplitude (1.2/1.8) and duty cycle
- Simultaneously generate RFFE traffic & protocol decode of the bus
- Continuous streaming protocol activity to host system HDD/SSD
- Timing diagram of protocol decoded bus
- Listing view of the protocol activity
- Error analysis of protocol activity
- Ability to write exerciser script to combine multiple data frame generation at different data speeds
- USB 2/3.0 host computer interface
- API support for automation in Python or C++
- Flexibility to upgrade to the unit for evolving RFFE specification
- Optional Protocol Implementation Compliance Statement (PICS) support scripts (for v 2.1)

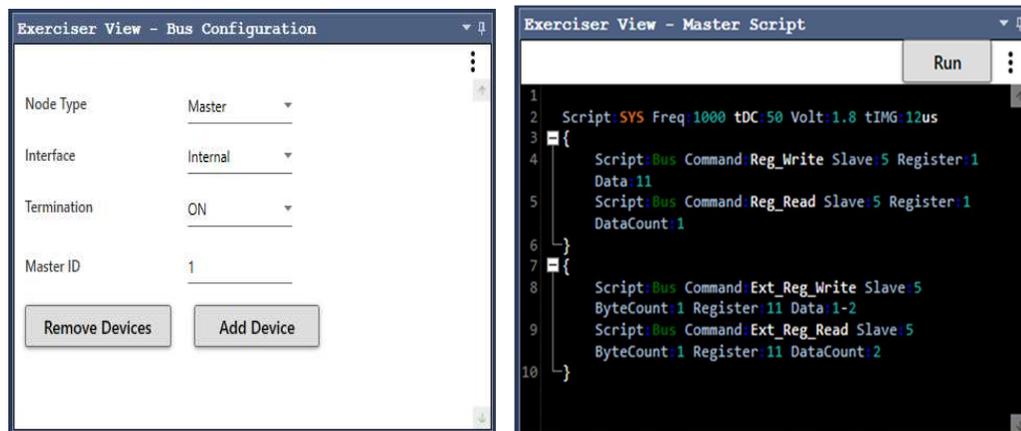**[1]Limited to 31MHz.**

Multi-domain View

Multidomain View provides the complete view of RFFE Protocol activity in single GUI. User can easily setup the analyzer to generate RFFE traffic using a GUI or script. User can set different trigger conditions from the setup menu to capture Protocol activity at specific event and decode the protocol transactions between Master and Slave. The decoded results can be viewed in timing diagram and Protocol listing window with autocorrelation. This comprehensive view of information makes it industry best, offering an easy to use solution to debug the RFFE protocol activity.

Exerciser

PGY-RFFE-EX-PD supports RFFE traffic generation using GUI and Script. User 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 RFFE traffic as below:

Script line #4: REG Write to the slave with USID 5

Script line #5: REG Read to the slave with USID 5

Script line #8: EXT REG Write to the slave with USID 5

Script line #9: EXT REG Read to the slave with USID 5

Timing Diagram and Protocol Listing View
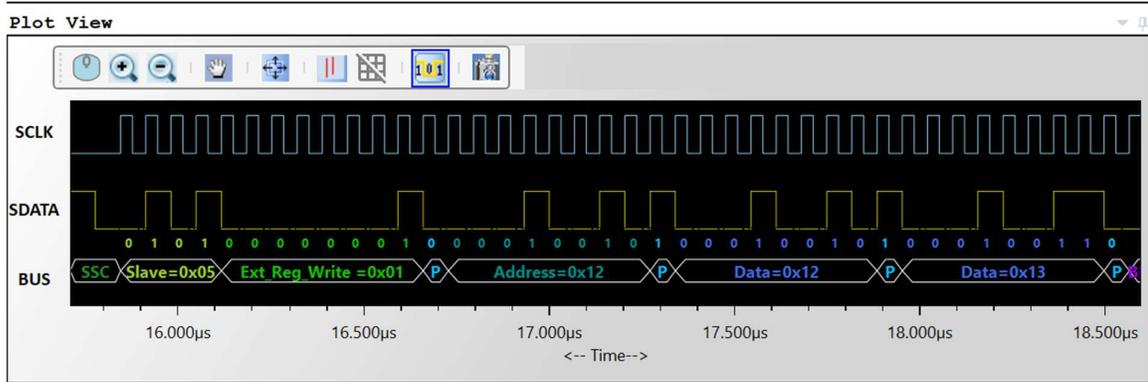
Timing view provides the plot of SCLK and SDATA signals with bus diagram. Overlaying of Protocol bits on the digital timing waveform will help easy debugging of Protocol decoded data. Cursor and Zoom features will make it convenient to analyze Protocol in timing diagram for any timing errors.

S. No	Time	Slave/MID	Command	Frequency	ByteCount	Reg Address	Data	Error
0	0s	0x5	Reg_Write	14.706 MHz	–	0x12	◯ Data – 1	Pass
1	12.648µs	0x5	Reg_Read	14.706 MHz	–	0x12	⊙ Data – 1	Pass
2	15.708µs	0x5	Ext_Reg_Write	14.706 MHz	0x1	0x12	⊙ Data – 2	Pass
3	18.904µs	0x5	Ext_Reg_Read	14.706 MHz	0x1	0x12	⊙ Data – 2	Pass
4	23.732µs	0x5	Ext_Reg_Write_Long	14.706 MHz	0x2	0x12	⊙ Data – 3	Pass
5	28.152µs	0x5	Ext_Reg_Read_Long	14.706 MHz	0x2	0x12	⊙ Data – 3	Pass
6	34.884µs	0x5	Reg_Zero_Write	14.706 MHz	–	0x0	⊙ Data – 1	Pass
7	13.881017s	0x5	Ext_Reg_Write	14.706 MHz	0x0	0x25	⊙ Data – 1	Pass
8	13.881019s	0x5	Ext_Reg_Write	14.706 MHz	0x0	0x27	⊙ Data – 1	Pass
9	38.096707s	0x5	Int_Summary_Ident	14.706 MHz	–	0x0		Pass
10	81.634330s	0x6	Reg_Write	14.706 MHz	–	0x10	⊙ Data – 1	Error

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

Powerful Trigger Capabilities

Trigger Selection

Trigger Type Advanced ▼

Level Count 2 ▼   ⋮

Level # 0

If

SSC | Ext_Reg_W ▼ | Slave/MID 5 | Byte Count 1

Register Address 1 | Data

Then   Action   Nothing ▼   Go to Level 1 ▼

Else If

SSC | Reg_Write ▼ | Slave/MID 5

Register Address 1 | Data

Then   Action   Trigger ▼

PGY-RFFE-EX-PD supports Auto, simple and advanced trigger capabilities. Analyzer can trigger on any of the Protocol packets such as Ext. Reg. Write, Ext. Reg, read and so forth message. Advanced Trigger provides the flexibility to monitor Multiple trigger conditions and can set multiple state trigger machine.

PGY-RFFE-EX-PD Specification	Features	PGY-RFFE-EX-PD
Exerciser:		
Configurable	1 Master + 4 Slaves	✔
RFFE Traffic Generation	Custom RFFE traffic generation	✔
	Simulate real world network traffic	✔
SCL Frequency	32kHz to 52 MHz (45?)	✔
Voltage Drive Level	1.2 and 1.8V	✔
SCL Duty Cycle variation	25%, 50% and 75%	✔
SCL & SDA Delay	User Define in multiples of 2.5ns	✔
Delay between two messages	User Define	✔
Error injection	Parity Error Injection	✔
Protocol Analysis:		
Supports	RFFE 2.0/2.1 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 any user defined RFFE packet) Advanced (Multistate & Multilevel Trigger Capability)	✔
Capture Duration	Continuous streaming Protocol Data	✔
Protocol Error Report	PARITY	✔
Host Connectivity	USB 3.0 / 2.0 interface	✔

Ordering Information

PGY-RFFE-EX-PD (v 2.0): RFFE Protocol Exerciser and Analyzer (v 2.0 specification supported)
PGY-RFFE-EX-PD (v2.1): RFFE Protocol Exerciser and Analyzer (v 2.1 specification supported)
PGY-RFFE-UPG (v2.0 to v 2.1): RFFE Protocol Exerciser and Analyzer upgrade option from v 2.0 specification to v 2.1 specification)
-Opt PICS: Protocol Implementation Compliance statement for v 2.1 specification

Deliverables for PGY-RFFE-EX-PD

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

Contact Information

Address:	Prodigy Technovations Pvt Ltd 294, 7th Cross, 7th main, BTM 2nd Stage, Bengaluru – 560076. Karnataka India.
Website:	www.prodigytechno.com
Technical Support:	contact@prodigytechno.com
Phone:	+91-80-42126100

About Prodigy Technovations Pvt Ltd Prodigy

Prodigy Technovations Pvt Ltd (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 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.