

PGY-I3C-EX-PD I3C Protocol Exerciser and Analyzer



I3C Protocol Exerciser and Analyzer

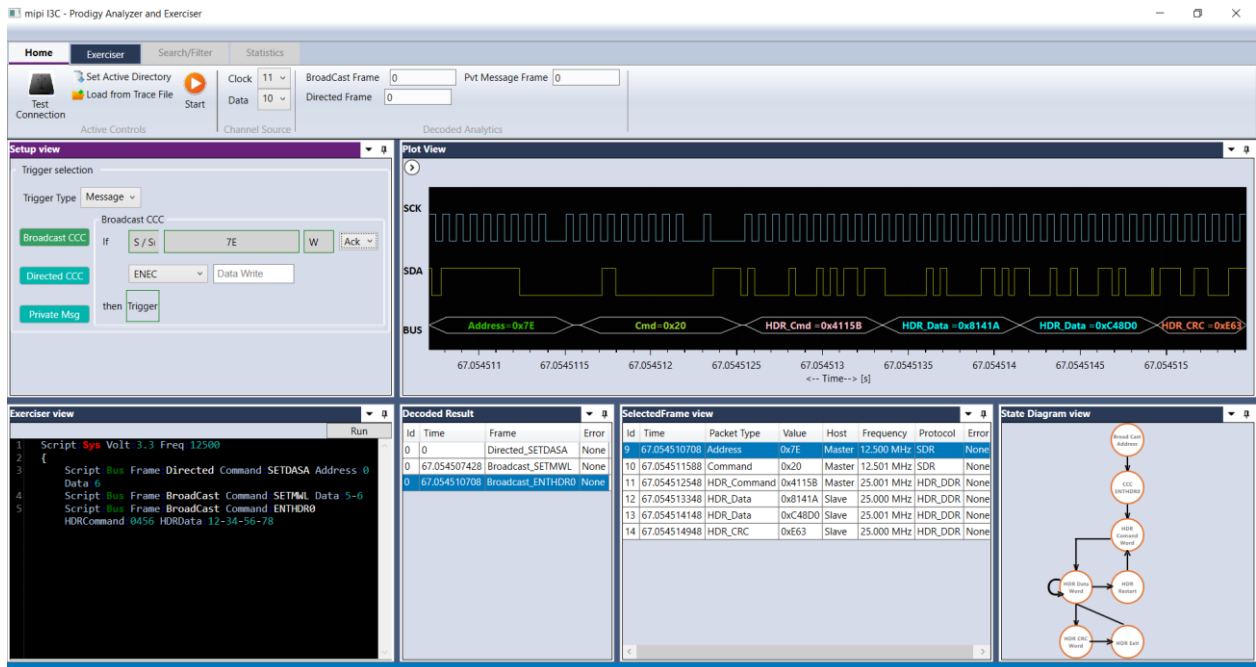
I3C Serial bus interface is emerging as a chosen interface for all future sensor connectivity in mobile phone and automotive Industry. This could also be chosen for low cost, reliable interface for future embedded electronic applications to address the new data intensive applications.

PGY-I3C-EX-PD is the leading instrument that enables the design and test engineers to test the I3C designs for its specifications by configuring PGY-I3C-EX-ED as master/slave, generating I3C traffic with error injection capability and decoding I3C Protocol decode packets.

Features:

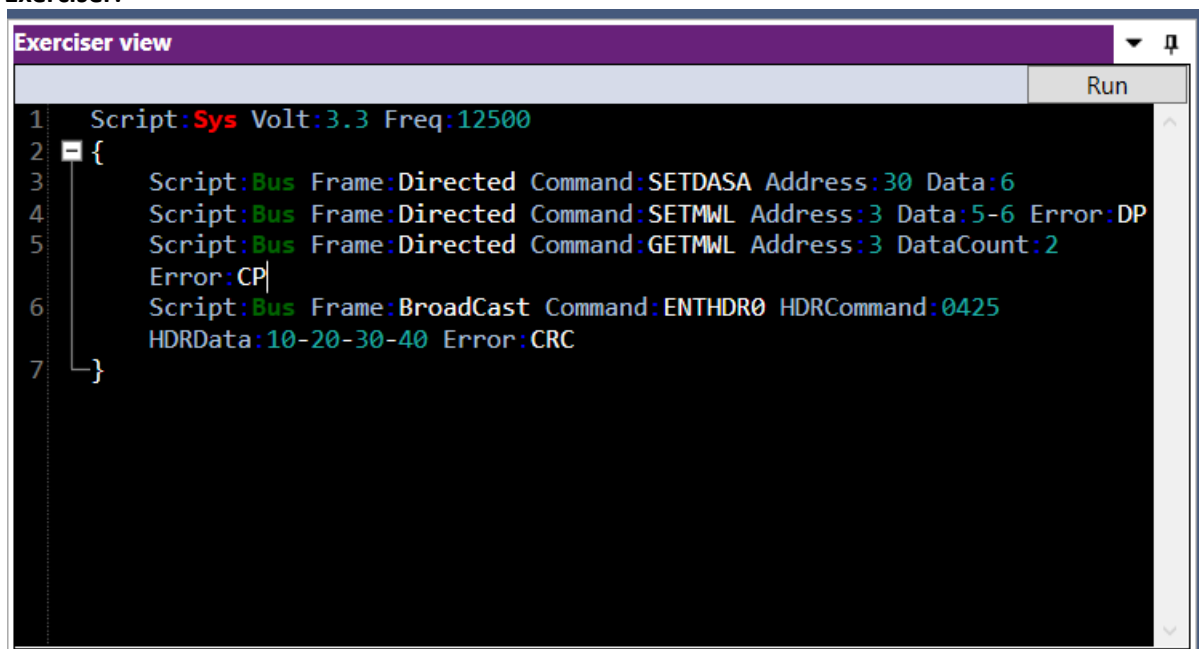
- Ability to configure it as Master or Slave
- Ability to configure BCR, LVR and DCR registers
- Supports legacy I2C slaves and Master
- Generate different I3C and I2C SDR and HDR Packets
- Flexibility to upgrade the unit TSP and TSL encoding (When it is available)
- Error Injection such CRC errors, parity errors and ACK/NACK errors
- Variable I3C data speeds
- Simultaneously generate I3C traffic and Protocol decode of the Bus
- Timing diagram of Protocol decoded bus
- Listing view of Protocol activity
- Error Analysis in Protocol Decode
- State Machine view of the I3C packets
- Ability to write exerciser script to combine multiple data frame generation at different data speeds
- USB2/3 host computer interface
- Flexibility to upgrade to the unit for evolving I3C Specification

Multi-domain View



Multidomain View provides the complete view of I3C Protocol activity in single GUI. User can easily setup the analyzer to generate I3C/I2C 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 transition between Master and Slave. The decoded results can be viewed in timing diagram and Protocol listing window with autocorrelation. State machine view provides switching of state machine between master and slave for design validation. This comprehensive view of information makes it industry best, offering an easy to use solution to debug the I3C protocol activity.

Exerciser:



```

1 Script: Sys Volt: 3.3 Freq: 12500
2 {
3   Script: Bus Frame: Directed Command: SETDASA Address: 30 Data: 6
4   Script: Bus Frame: Directed Command: SETMWL Address: 3 Data: 5-6 Error: DP
5   Script: Bus Frame: Directed Command: GETMWL Address: 3 DataCount: 2
6   Error: CP
7   Script: Bus Frame: Broadcast Command: ENTHDR0 HDRCommand: 0425
8   HDRData: 10-20-30-40 Error: CRC
9 }
  
```

PGY-I3C-EX-PD supports I3C 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 I3C traffic as below.

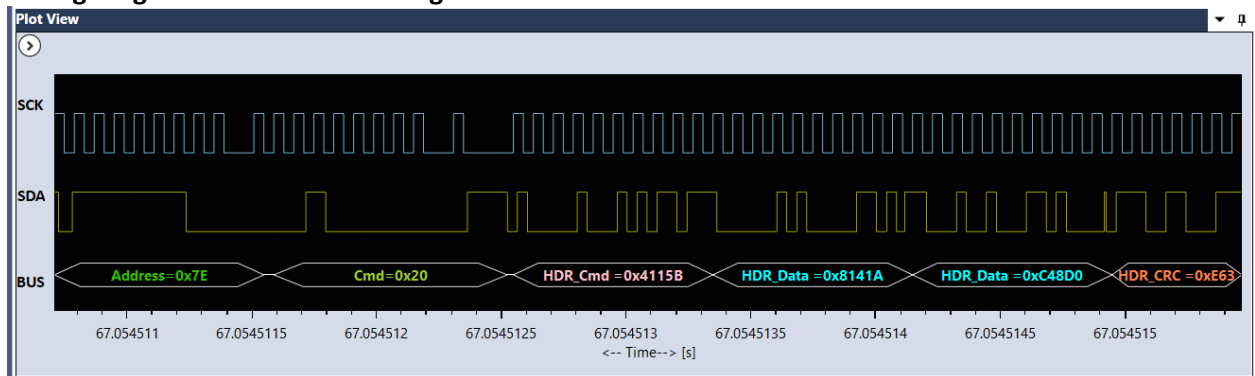
Script line #3: SET Dynamic Address using slave static

Script line #4: SETMWL with Data Parity Error

Script line #5: GETMWL with Command Parity Error

Script line #6: ENTHDR0 DDR mode with CRC Error

Timing Diagram and Protocol Listing View

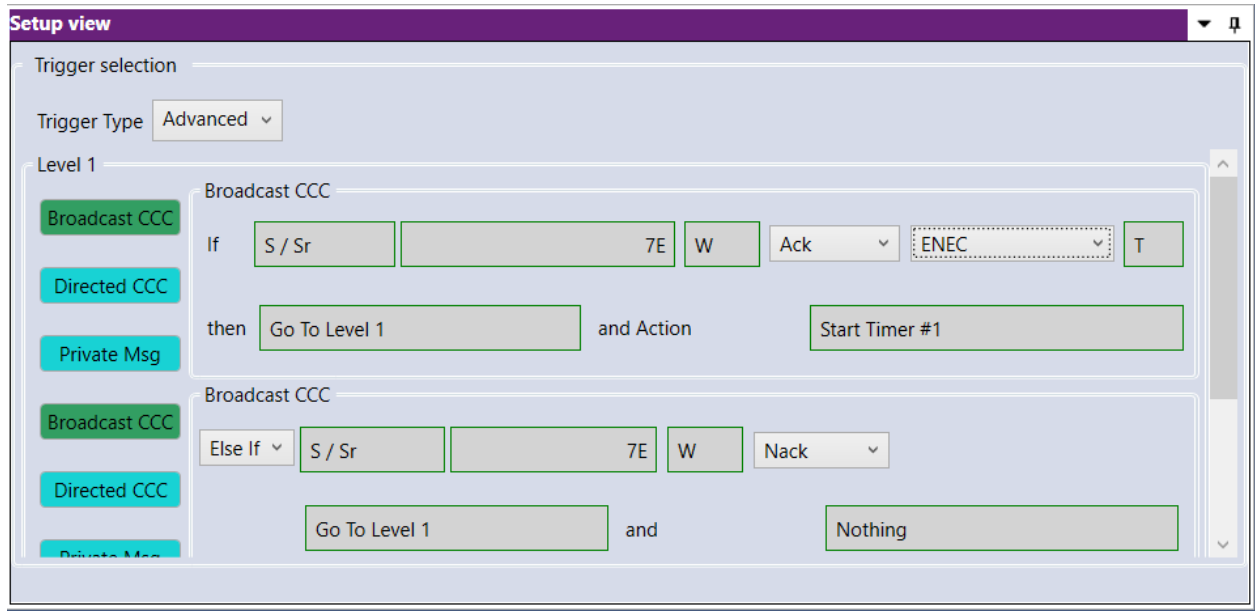


Timing view provides the plot of SCL and SDA signals with bus diagram. Overlaying of Protocol bits on the digital timing waveform will help easy debugging of Protocol decoded data. Cursor and Zoom features will make it convenient to analyze Protocol in timing diagram for any timing errors.

Decoded Result				SelectedFrame view							
Id	Time	Frame	Error	Id	Time	Packet Type	Value	Host	Frequency	Protocol	Error
0	0	Directed_SETDASA	None	9	67.054510708	Address	0x7E	Master	12.500 MHz	SDR	None
0	67.054507428	Broadcast_SETMWL	None	10	67.054511588	Command	0x20	Master	12.501 MHz	SDR	None
0	67.054510708	Broadcast_ENTHDR0	None	11	67.054512548	HDR_Command	0x4115B	Master	25.001 MHz	HDR_DDR	None
				12	67.054513348	HDR_Data	0x8141A	Slave	25.000 MHz	HDR_DDR	None
				13	67.054514148	HDR_Data	0xC48D0	Slave	25.001 MHz	HDR_DDR	None
				14	67.054514948	HDR_CRC	0xE63	Slave	25.000 MHz	HDR_DDR	None

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:



Setup view

Trigger selection

Trigger Type: Advanced

Level 1

Broadcast CCC

If: S / Sr 7E W Ack ENEC T

then: Go To Level 1 and Action: Start Timer #1

Broadcast CCC

Else If: S / Sr 7E W Nack

then: Go To Level 1 and Action: Nothing

PGY-I3C-EX-PD supports Auto, simple and advanced trigger capabilities. Analyzer can trigger on any of the Protocol packets such as Broadcast, Directed or Private message. Advanced Trigger provides the flexibility to monitor Multiple trigger conditions and can set multiple state trigger machine. User can initiate a timer and trigger on set timer values.



PGY-I3C Specification	Features	PGY-I3C-EX-PD	PGY-I3C-EX-PD-Lite
Exerciser:			
Configurable	1 Master + 4 Slaves OR 5 Slaves OR Slave with Secondary Master	✓	✓
I3C / I2C Traffic Generation	Custom I3C / I2C traffic generation	✓	✓
	Simulate real world network traffic	✓	✗
SCL Frequency	400KHz to 13.5MHz	✓	✓
Voltage Drive Level	1V to 3.3V at steps of 100mV	✓	✗
Hot Join	Yes, supported	✓	✓
IBI	Yes, supported	✓	✗
CCC Support	All CCC are supported except SETXTIME, ENTSM, ENTAS*	✓	✓
SCL Duty Cycle variation	User Define	✓	✗
SCL & SDA Delay	User Define	✓	✗
Delay between two messages	User Define	✓	✗
Error injection	S0 to S5 types of errors specified in I3C specifications CRC errors in DDR traffic Preamble errors in DDR traffic ACK / NACK Errors (Slave) Master Abort Non-Standard Frames Non-Standard Start, Stop and HDR exit patterns Save and Load Scripts	✓	✗
API Support	Support for Automation of operation using Python	✓	✗
Protocol Analysis:			
Supports	I3C & I2C 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 I3C or I2C packet) Advanced (Multistate & Multilevel trigger with timer capability)	✓	✓ (No Advanced Trigger Support)
Capture Duration	Continuous streaming Protocol Data to host HDD/SSD	✓	✓
Protocol Error Report	S0 to S5 types of errors specified in the I3C specifications CRC errors in DDR traffic Preamble errors in DDR traffic ACK /NACK Errors (Slave) Master Abort Non-Standard frames Non-standard Start, Stop and HDR exit patterns.	✓	✓
Host Connectivity	USB 3.0 / 2.0 interface	✓	✓

Ordering Information

PGY-I3C-EX-PD I3C Protocol Exerciser and Analyzer

PGY-I3C-EX-PD-Lite I3C Protocol Exerciser and Analyzer (lite version)

Deliverables for PGY-I3C-EX-PD:

PGY-I3C-EX-PD Unit

USB3.0 cable

PGY-I3C-EX-PD Software in CD

12V DC adopter

Flying lead probe cable with female connector to connect to DUT

Deliverables for PGY-I3C-EX-PD-Lite

PGY-I3C-EX-PD-Lite unit

USB3.0 cable

PGY-I3C-EX-PD-Lite Software in CD

Flying Leas probe cable with connector

Contact Information:**Address:**

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About Prodigy Technovations Pvt Ltd 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.