

PGY-UFS-PA MPHY, UniPRO, UFS Protocol Analzyer

Deep Capture, Powerful Trigger, In-depth Analysis



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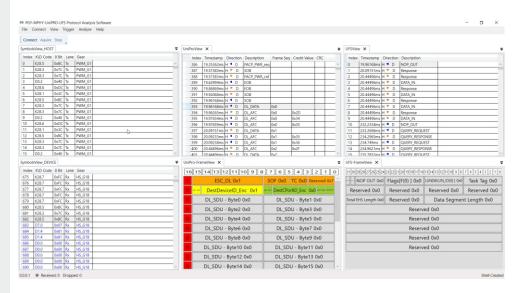
Key features

- Supports version MPHY 3.1, UniPRO 1.61 and UFS version 2.1
- Supports PWM G1 to G7 and HS G1,2,3 A and B Series
- Supports one/two data lanes
 (2TX and 2RX)
- Flexibility to capture very large data using continuous streaming of Protocol data to host computer
- · Solderdown active probe provide high signal fidelity
- Decoding at MPHY, UniPRO and UFS layer
- Trigger based on MPHY, UniPRO, UFS layer packet content
- Supports triggering in PWM and HS data rate speeds
- Trigger out signal at trigger event allows the triggering of other instruments suchas oscilloscope
- Interface to host system using USB3.0 or Gigabit EthernetInterface
- Flexibility to upgrade the hardware firmware using GbE interface provides easy field up gradation of FPGA firmware
- Decoded data packets can be exported to txt file for further analysis
- PGY Protocol Analyzer is light weight and can be deployed for on-site/ field tests

PGY-UFS-PA, UFS Protocol Analyzer, value based analyzer in its class, offers capture and debug of data across MPHY, UniPRO and UFS protocol layers. It allows for instantaneous decoding of UFS layer, UniPRO layer and MPHY layer with flexibility to correlate decoded data across these protocol layers. PGY-UFS-PA Supports PWMG1 to HSG3B data rates and two TX, two RX lane decode. The active probe has minimum electrical loading on device under test (DUT) and captures protocol data without affecting the performance of DUT. PGY-UFS-PA protocol Analyzer can support two lane data. Comprehensive decoding of data, protocol tests and error analysis enables validation of communication between UFS host and device.

PGY-UFS-PA, UFS Protocol Analyzer allows Design and Test Engineers to obtain deep insight into UFS host and device communication. MPHY/UniPRO/UFSpacket based triggering allows specific protocol data capture and analysis. PGY-UFS-PA Protocol analyzer instantaneously provides decoding of UFS layer, UniPRO layer and MPHY layer with a correlation to MPHY, UniPRO and UFS layer.

Solder down active probes allows probing the MPHY test points. This allows the design and test engineers to capture UFS traffic between the host and UFS memory with high signal fidelity. Today's test engineers need the ability to test use case scenarios in their labs that mimic real-life use cases. The PGY-UFS-PA, UFS Protocol Analyzer has been designed to enable engineers to closely monitor and analyze the traffic between the host and the device while executing the various use case scenarios



Windows based UFS protocol Analysis software, provides industry best protocol correlation between UFS layer to UniPRO layer and MPHY layer. Time correlation between the different protocol layers significantly reduces debug time of designs. Floating window design of this software allows engineers to view UFS view, UniPRO view and MPHY view on different computer monitors and automatically correlate the UFS packets to MPHY layer. This makes analysis very easy while analyzing gigabytes of Protocol information.

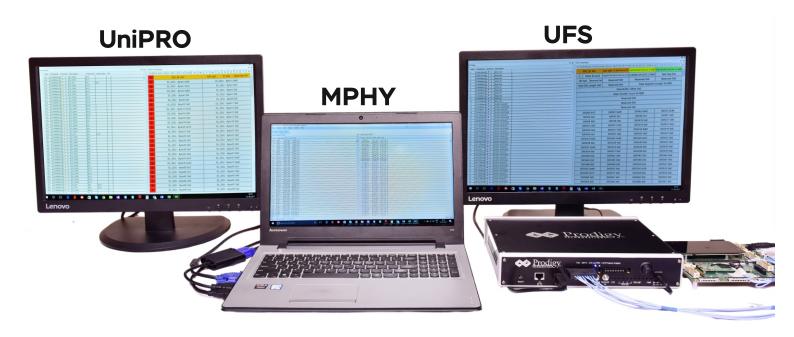


Setup



PGY-UFS-PA UFS Protocol Analyzer provides USB3.0 and Gbe interface for host computer connectivity. Highspeed host connectivity enables continuous streaming of protocol data to host HDD and storage for long period of time. Floating window software architecture allows the user to view each protocol layer on separate monitors for easy debug. Autocorrelation of each selected packet from UFS layer to MPHY layer simplifies the debug activity

Comprehensive Protocol Analysis using Multi-View



PGY-UFS Software offers multi-view MPHY view, UniPRO view and UFS View. Each view lists the respective protocol packets and its details with correlation of each layer for easy debug.



Powerful Trigger Capabilities

iggerView		• • >
Device La	ane 0	^
DispErr	8b10b Error MPHY State HS_Data ~	
Pattern M	Match	
Pattern 0	Control/Data Symbols Value Control K28_0 00011100	
Pattern 1	Control/Data Symbols Value Control K28_0 00011100	
Device La	ane 1	
DispErr	8b10b Error MPHY State HS_Data ~	
Pattern M	/atch	
Pattern 0	Control/Data Symbols Value Control V K28_0 Volue	
Pattern 1	Control/Data Symbols Value Control K28_0 00011100	
√ Group Tx		_
PACP	PACP_PWR_cnf ~	
CPortID	0 ~	
Merge E	rror NO_MERGE_ONLY_LANE_0 ~	
DLSOF	DLEOF DLCOF	
DLNAC	DLAFC DSCREn	
Group R	s	
-	ALL Y	
PACP	0 ~	
CPortID		
	NO_MERGE_ONLY_LANE_0	
CPortID	rror NO_MERGE_ONLY_LANE_0 DLEOF DLCOF	

PGY-UFS-PA UFS Protocol Analyzer offers powerful hardware based trigger capabilities allowing design and test engineer to capture the protocol activity at specific event. Hardware based algorithm computes the CRC values in real time and can trigger on CRC error. Triggering on any of the UniPRO layer protocol packet or Bad alignments (Improper marker values) reduces the debug time.

UniPRO Protocol Layer view

PGY-MPHY-UniPRO-UFS Protocol Analysis Software ٥ File Connect View Trigger Analyse Help Connect Aquire Stop SymbolsView_HOST UniProView • ¤ × UniPro-FrameView лх 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0 Index K\D Code 8 Bit Lane Gear Index Timestamp Direction Description Frame Seg Credit Value CRC 0x12 Tx PWM_G1 0xE8 Tx PWM_G1 366 10.66119ms H ◀ D PACP_CAP_ind 233 D18.0 EscParam_PA = PACP_BEGIN 0x1 ESC PA 0x1 234 D8.7 367 10.70149ms H 4 D EOB D23.7 368 10.8011ms H D EOB 369 10.98382ms H D SOB PACP_FuntionId = PACP_PWR_req 0x10E 0xF7 Tx PWM_G 235 236 K28.5 0xBC Tx PWM_G Reserved 0x6 Flags 0x1 Flags 0x0 Flags 0x1 Flags 0x0 Flags 0x1 Flags 0x1 Flags 0x1 DevID 0x0 237 D3.6 238 D31.7 0xC3 Tx PWM_G 370 10.98382ms H > D DL_AF 0x1F 0x12 371 10.99318ms H D DL_AFC 372 11.04466ms H D EOB 0xFF Tx PWM_G1 RxMode 0x1 RxLane 0x1 RxGear 0x1 TxMode 0x1 TxLane 0x1 TxGear 0x1 0x2C 239 D12.1 0x2C Tx PWM_G PAPowerModeUserData[0] 0x0 240 0x7C Tx PWM_G 373 11.89886ms H D SOB D28.3 375 11.90462ms H D DL_AFC 375 11.91613ms H D DL_AFC 241 0x09 Tx PWM_G1 D9.0 0x1F PAPowerModeUserData[1] 0x0 242 K28.6 0xDC Tx PWM_G1 0x1F 0x34 243 K28.1 244 K28.6 376 11.92189ms H ◀ D EOB 377 12.07402ms H ► D SOB 0x3C Tx PWM_G1 0xDC Tx PWM_G1 PAPowerModeUserData[2] 0x0 PAPowerModeUserData[3] 0x0 245 K28.1 0x3C Tx PWM G 378 12.07871ms H > D DL AF 0x1F 0x12 370 12:070 min H D DL_AFC 379 12:0834ms H D DL_AFC 380 12:13957ms H D EOB 381 12:39966ms H D SOB PWM_G 246 247 K28.5 xBC Tx PAPowerModeUserData[4] 0x0 K28.3 0x7C Tx PAPowerModeUserData[5] 0x0 248 K28.3 0x7C Tx PWM_G1 382 12.40542ms H D DL_AFG 383 12.41694ms H D DL_AFG PAPowerModeUserData[6] 0xFFFF SymbolsView_DEVICE = Index K\D Code 8 Bit Lane Gear PAPowerModeUserData[7] 0xFFFF 384 12.42269ms H < D EOB 0x7C Rx PWM_G1 636 K28.3 H I D PAPowerModeUserData[8] 0xFFFF 637 0x01 Rx PWM_G 387 19.57383ms H 🏲 D SOB 638 D1.0 0x01 Rx PWM_G1 PAPowerModeUserData[9] 0xFFFF 388 19.57383ms H D PACP_PWR_cnf 389 19.62994ms H D EOB PAPowerModeUserData[10] 0xFFFF 640 D0.0 0x00 Rx PWM_G1 641 D27.6 PWM G 390 19.86869ms H > D EOB 0xDB Rx PAPowerModeUserData[11] 0xFFFF 391 19.92068ms H D SOB 392 19.96168ms H D SOB 0x29 Rx PWM_G 642 CRC16 Pass 0x7A4E 643 D9.1 PWM_G x29 Rx 393 19.96168ms H ◀ D DL_DATA 394 19.96265ms H D DL_AFC 644 PWM_G x00 Rx 645 x00 Rx 646 0x00 Rx PWM_G 395 19.97654ms H < D DL_AFC 0x34 647 648 PWM_G1 396 19.97659ms H ◀ D DL_AFC 397 20.09151ms H ► D DL_DATA)x00 Rx 0x00 Rx 649 0x00 Rx PWM_G1 398 20.09233ms H D DL_AFC 20.09238ms H D DL_AFC 0x1 0x1 0x35 0x36 0x00 Rx PWM_G1 0x00 Rx PWM_G1 651 0.0.0.1 R ed: 0 Drop

PGY-UFS-PA UFS Protocol Analysis offers multilayer of protocol view with flexibility to link all views for easy correlation of data. Selected packets details are displayed in a format which is similar to specification document format for easy correlation. This view provides bit level information to analyze the communication between UFS host and UFS memory.



UFS Protocol layer view

PGY-MPHY-UniPRO-UFS Protocol Analysis Software
 File Connect View Trigger Analyse Help

/mbolsView_HOST	Ŧ	UFSView	• ‡ ×	UFS-FrameView			•
Index K\D Code 8 Bit Lane Gear		Index Timestamp Direction Description		31 30 29 28 27 26 25 24	23 22 21 20 19 18 17 1	6 15 14 13 12 11 10 9 8	7 6 5 4 3 2
4809 D0.0 0x00 Tx HS_G1B	^	0 19.96168ms H < D NOP_OUT	^			LUN[WLUN_ID(1)] 0xB0	Task Tag 0x4
810 D0.0 0x00 Tx HS_G1B	_	1 20.09151ms H > D Response					
811 D0.0 0x00 Tx HS_G1B		2 20.44496ms H > D Response		IID 0x0 Reserved 0x0	Reserved 0x0	Reserved 0x0	Reserved 0x0
812 D0.0 0x00 Tx HS_G1B		3 20.44496ms H > D DATA_IN		Total EHS Length 0x0	Reserved 0x0	Data Segment L	enath 0x1000
013 K20.3 UXBC IX H3_010 -		4 20.44496ms H ► D Response		Total Ello Ecligationo			engurexteee
814 D19.1 0x33 Tx HS_G1B		D EXTENSION IN D DAIA_IN			Data Buffe	r Offset 0x0	
815 D0.1 0x20 Tx HS_G1B 816 D8.7 0xE8 Tx HS_G1B		6 20.44496ms H > D Response 7 20.44496ms H > D DATA IN			Data Transfer	Count 0x1000	
317 K28.5 0xBC Tx HS_G1B	_	8 20.44496ms H D Response					
818 D3.6 0xC3 Tx HS G18	_	9 20.44496ms H > D DATA_IN			Reserv	red 0x0	
819 D7.1 0x27 Tx HS_G18	_	10 232.2334ms H D NOP_OUT		Reserved 0x0			
820 D17.1 0x31 Tx HS_G1B	_	11 233.2696ms H D QUERY_REQUEST					
821 D3.1 0x23 Tx HS G1B	_	12 234.2965ms H > D QUERY_RESPONSE			Reserv	red 0x0	
322 D27.0 0x1B Tx HS_G1B		13 234.749ms H D QUERY_REQUEST		DATA0 0x2C	DATA1 0xBA	DATA2 0xA0	DATA3 0xDE
323 K28.5 0xBC Tx HS_G1B		14 234.9621ms H > D QUERY_RESPONSE			D.1715.0.50	DITIGO E	D 1717 0 10
324 D7.0 0x07 Tx HS_G1B	~	15 235.7852ms H D QUERY_REQUEST		DATA4 0xDD	DATA5 0xCB	DATA6 0x5	DATA7 0x48
nbolsView_DEVICE	=	16 236.0029ms H > D QUERY_RESPONSE		DATA8 0xB4	DATA9 0xF9	DATA10 0xF4	DATA11 0x28
	-	17 236.8214ms H D QUERY_REQUEST		D 171 10 0 05	D. T. () 0 (C	DATALO DE	D. T. 45 0.00
ndex K\D Code 8 Bit Lane Gear		18 237.0391ms H D QUERY_RESPONSE		DATA12 0x25	DATA13 0x1C	DATA14 0x3E	DATA15 0x98
75 K28.7 0xFC Rx HS_G1B		19 237.8576ms H D QUERY_REQUEST		DATA16 0x50	DATA17 0x14	DATA18 0xA8	DATA19 0x54
76 K28.7 0xFC Rx HS_G1B 77 K28.7 0xFC Rx HS_G1B		20 238.0753ms H ► D QUERY_RESPONSE 21 238.8938ms H ◄ D QUERY_REQUEST			DATA21 OUES	DATA 22 OVAC	
78 K28.7 0xFC Rx HS_G1B	_	21 238.8938ms H D QUERY_REQUEST 22 239.1116ms H ► D QUERY_RESPONSE		DATA20 0x4F	DATA21 0xEE	DATA22 0xA6	DATA23 0xEE
79 K28.7 0xFC Rx HS_G1B	_	23 239.9299ms H D QUERY_REQUEST		DATA24 0x99	DATA25 0x4F	DATA26 0x59	DATA27 0xE
80 K28.5 0xBC Rx HS_G1B	_	24 240.1477ms H > D QUERY_RESPONSE		DATA28 0xC2	DATA29 0xB0	DATA30 0x21	DATA31 0x84
B1 K28.3 0x7C Rx HS_G1B	_	25 240.9661ms H D QUERY_REQUEST		DATA20 UXC2	DATA29 UXDU	DATASO 0X21	DATAST 0X04
82 K28.5 0xBC Rx HS_G1B	_	26 241.1838ms H > D QUERY_RESPONSE		DATA32 0x6	DATA33 0x0	DATA34 0x0	DATA35 0x0
83 D7.0 0x07 Rx HS_G1B		27 242.0023ms H D QUERY_REQUEST		DATA36 0x0	DATA37 0x0	DATA38 0x0	DATA39 0x0
34 D1.4 0x81 Rx HS_G1B		28 242.22ms H > D QUERY_RESPONSE		DATASO 0X0	DATAST UXU	DATASO 0X0	DATA39 0X0
35 D1.4 0x81 Rx HS_G1B		29 243.0385ms H D QUERY_REQUEST		DATA40 0xFA	DATA41 0x3	DATA42 0x0	DATA43 0x0
36 D0.0 0x00 Rx HS_G1B		30 243.2563ms H ► D QUERY_RESPONSE		DATA44 0x0	DATA45 0x0	DATA46 0x0	DATA47 0x0
87 D0.0 0x00 Rx HS_G1B		31 244.0747ms H D QUERY_REQUEST					
88 D0.0 0x00 Rx HS_G1B		32 244.2924ms H D QUERY_RESPONSE		DATA48 0x0	DATA49 0x0	DATA50 0x0	DATA51 0x0
isian D0.0 Ox00 Rx HS_G1B isian D0.0 0x00 Rx HS_G1B		33 245.1109ms H ◀ D QUERY_REQUEST 34 245.3286ms H ► D QUERY_RESPONSE		DATA52 0x0	DATA53 0x0	DATA54 0x0	DATA55 0x10
0 D0.0 0x00 Kx HS_G1B	~	34 245.3286ms H D OUERY RESPONSE		DATASE OXO	BAIA55 OKO	BAIASTONO	DAIA33 OATO

UFS layer view has UFS view and UFS Frame view. UFS view list all the UFS packets and UFS Frame view provides selected packets decoding at UFS packet format.

Specifications

Data Rates Supported	PWM G1 to G7, High Speed Gear 1, Gear 2, and Gear 3 A and B Series
Link Width	Configurable for 1TX/1RX or 2TX/2RX
Probes	Solder Down Active Probes/ SMA Probes at probe tip
Protocol Decode	MPHY, UniPRO and UFS layer
Trace Capture Size	Supports Continuous streaming of Protocol data to Host computer SSD/HDD.
Trigger	Based MPHY, UniPRO and UFS Packets
Front Panel Connectors	Interface for Active probes. Trigger in/out SMA connectors
Interface for Host Computer	USB3.0 and Gigabit Ethernet interface
Host Computer Requirements	Windows 7/8.0/8.1/10 64bit operating System. It requires RAM of minimum 8GB but the product would give a faster response for a 16GB.The minimum storage capacity of 1GB should be available in the hard disk drive. User can use more storage based on trace storage requirement. Display resolution of the monitor is 1024X768. Host computer should support USB3.0 or GBe interface.
Dimension (W x H x D)	(20.5X5X25)cms
Weight	Approx. 2.5Kg
Power Requirement	12V, 3A DC Power Supply (AC/DC Adapter Supplied along with Analyzer)



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Trigger Specifications

Stack	Protocol Layer	Packet Type
	art-	Trig_UPRO0
	Link Start- up Sequence	Trig_UPRO1
	Se Lir	Trig_UPRO2
	ନି	PACP_PWR_reg
	AC	PACP_PWR_cnf
	e e	PAC_Cap_ind
	ets	PACP_Cap_EXT1_ind
	ac X	PACO_EPR_ind
	l å	PACP_TestMode_req
	Dte	PACP_Get_req
l Q	PHY Capability Adapter Packets (PACP)	PACP_Get_cnf
JniPRO		PACP_SER_req
2		PACP_SET_cnf
		PACP_TEST_DATA_0
		PACP_Test_DATA_1
		PACP_Test_DATA_2
		PACP_Test_DATA_3
	S	SOF
	:ket	EOF
	bac	EOF_ODD
	논	EOF_EVEN
	l il e	COF
	Data Link packets	AFC/NAC
		Traffic Class O/Traffic Class 1
		NOP IN
	ts	NOP OUT
UFS	ke ke	Command
	UFS layer Packets	Response
		Task Management Request
	la)	task Management Response
	LES	Ready To Transfer
		Query Request
		Query Respond



Search and Filter

PGY-UFS-PA UFSProtocol Analyzer offers flexibility to search or filter for specific packets. This allows the easy location of specific packets in huge protocol packet data.

Analytics

PGY-UFS-PAUFS software would allow an engineer to quickly view the error conditions.

- Errors reported in packets
- · Linking the error bit info to packets
- · CRC errors
- · Gear changing information
- · Lane width
- · Credit information
- · Performance Analysis of packets

Ordering information

PGY-UFS-PA UFS Protocol Analyzer

(Shipment includes Hardware, software CD, One set probe, USB3.0, Ethernet Cable andPower adapter)

Warranty

Hardware and software carries a warranty of one year. Probes are covered for a three month warranty for any manufacturing defects

Contact

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About Prodigy Technovations Pvt. Ltd

Prodigy Technovations is the leading provider of innovative protocol analysis solutions for mainstream and emerging technologies. We provide Protocol Decode, and PHY layer testing solutions on Test & Measurements equipment's. The company's ongoing efforts include successful implementation of innovative and comprehensive protocol Analysis solutions using latest hardware technologies.



