



	PHY-UniPRO-UFS										- 0	>		
e Set	up View Trigge	r Analytics	Report Hel	p										
nnect	Acquire Stop Acc	g Stop Transfe	er Stop R	eset 💡										
nbolsVie	ew_HOST			↓ ‡	× UFSView	×								
ndex	K\D Code	8 Bit	Lane	Gear		Index	Timestamp	Host	Device					
9	K28.5	0xBC	Tx	PWM_G1	^	3 24.54772ms			OUERY RE	SPONSE(Success)				
L	K28.3	0x7C	Tx	PWM_G1		4	1.0248755	REQUEST SENSE						
2	K28.5	ØxBC	Tx	PWM_G1		5	1.025185	negoest_sens	DATA IN					
3	K28.3	0x7C	Tx	PWM_G1		6	1.0252575		RESPONSE					
4	K28.3	0x7C	Tx	PWM_G1		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		PROVIDER CENT		8	~			
5	D0.2	0x40	Tx	PWM_G1		7	1.025584s	REQUEST_SENSE						
6	K28.3	0x7C	Tx	PWM_G1		8	1.025907s		DATA_IN					
7	D1.2	0x41	Tx	PWM_G1		9	1.025984s		RESPONSE					
3	K28.6	ØxDC	Tx	PWM_G1		10	1.027766s	NOP_OUT						
9	K28.1	0x3C	Tx	PWM_G1		11	1.028051s		NOP_IN					
10	K28.6	ØxDC	Tx	PWM_G1		12	1.0280765	WRITE 10						
11	1 K28.1 0x3C Tx PWM_G1		PWM_G1	~	13	1.028081s		READY TO	TRANSFER					
¢.				>		14	1 030001-		DEADY TO					
nbolsVie	ew DEVICE			~ Ą	× UFS-Frame	View X								
ndex	K\D Code	8 Bit	Lane	Gear		20 20 27 26 28	2422222	20 10 10 17 16	15 14 13 12 11 10	0 0 7 6 5		-		
0	K28.5	0xBC	Rx	PWM G1			1	II.		1				
1	K28.3	0x7C	Rx	PWM G1	HD GHD OD GHD	HO NO DO NO DATA IN 0x22 Fla		gs 0x0	LUN 0x0	Tas	Task Tag 0x55			
2	K28.5	0xBC	Rx	PWM G1		IID 0x0 Reserved 0x0		rved 0x0	Reserved 0x0	Por	Reserved 0x0			
3	K28.3	0x7C	Rx	PWM G1										
1	K28.3	0x7C	Rx	PWM_G1	Tota	I EHS Length 0x0	Reser	rved 0x0	Data Seg	gment Length 0»	(12			
5	D0.2	0x40	Rx	PWM_G1										
5	K28.3	0x7C	Rx	PWM_G1			Data Buffer Offset 0x0							
7	D1.2	0x41	Rx	PWM_G1										
3	K28.6	0xDC	Rx	PWM_G1		Reserved 0x0						_		
9	K28.1	0x3C	Rx	PWM_G1				Reserve	u uxu					
0	K28.6	ØxDC	Rx	PWM_G1				Reserve	d 0x0					
11	K28.1	0x3C	Rx	PWM G1				Reserve				_		

MIPI-MPHY-UniPRO/LLI/UFS Protocol Decode Software

1.0.6.1 HSG4B_2L_5_2_22

Analysis Stopped..

In an emerging technology, engineers test and debug UniPRO/LLI/UFS designs with easy-to-use instruments such as oscilloscopes. But oscilloscopes normally provide extensive details about electrical characteristics of the signal. But engineers need more information such as protocol content at different protocol layer. Manually interpreting the protocol layer information using oscilloscope data is time consuming and prone to human error.

The PGY-UniPRO/LLI/UFS Protocol Decode Software offers extensive protocol decoding for MIPI-MPHY-UniPRO, LLI, and UFS protocol standards. This software offers Real-time hardware based UniPRO/UFS Protocol aware trigger for PWM, NRZ and 8B/10B data type. Now design and test engineers can automatically make accurate and reliable decode of multi-lane UniPRO/LLI/UFS using PGY-UniPro/LLI/UFS software using data acquired by Tektronix, DPO/DSA/MSO70000 oscilloscope series to reduce the development and test cycle.

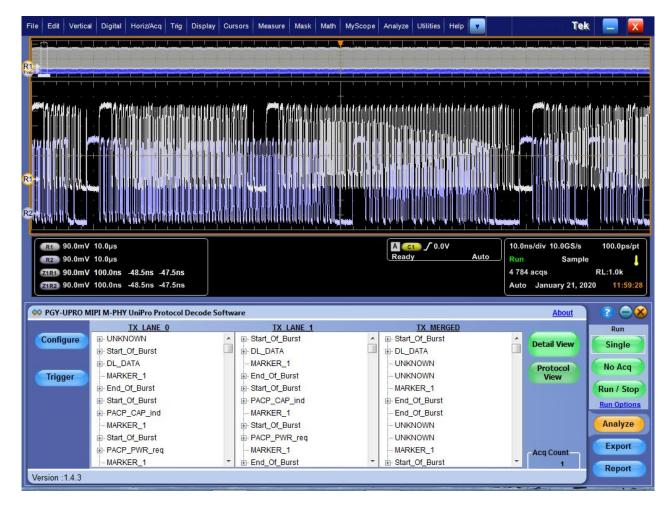
Key Features

- UniPro and LLI Protocol Decoder enables faster system level protocol debugging.
- Conforms to UniPro Protocol Specification version 1.6 and LLI Protocol version 1.0.
- Conforms to UFS Protocol Specification Version 2.0.
- Supports NRZ (Non-Return-to-Zero) and PWM (Pulse Width Modulation) signaling schemes.
- Configurable four lane simultaneous protocol decode helps to correlate the lane to lane events.



Auto link of decoded data from list table to oscilloscope waveform for easy protocol debug at PHY layer.

- Powerful UniPRO/LLI Protocol aware trigger features using option ST6G serial trigger feature of oscilloscopes.
- Triggering supports PWM, NRZ and 8b/10B encoded data schemes.
- Detail view provides a comprehensive protocol and physical layer data correlation.
- ✤ Frame listing and frame description provides comprehensive protocol layer information.
- Each frame is displayed in detail as per UniPro and LLI Standard specification document.
- Automated CRC computation to monitor CRC errors in protocol packet.
- Markers enables time measurement between messages in different lanes.
- Software automatically identifies the signaling scheme and gear for hassle free protocol analysis.
- Bus diagram functions such as zoom in, zoom out, pan, fit to screen, synchronize functions enables easy data analysis.
- Supports oscilloscope live channels, Tektronix .wfm waveform files.
- Generates comprehensive and customizable reports.
- Ability to export the protocol details to .txt and .csv file formats.



Seamless Integration with Tektronix Oscilloscope



PGY-UniPRO/LLI/UFS runs inside the Tektronix oscilloscopes and decodes protocols and displays the decoded data of multiple lanes. This software links the decoded data to the electrical signal in the oscilloscope display. UniPRO/LLI Protocol-based trigger can be set up using the built-in high-speed serial trigger capabilities in Tektronix oscilloscopes.

UniPRO Protocol Aware Trigger

🐼 PGY-UPRO M	MPI M-PHY Un	iiPro Protocol D	ecode Software			Activate About	?
Configure	Trigger Typ	<u>)e</u>	Trigger Event	<u>Trigger S</u>	<u>Trigger Description</u>		Run Single
	Serial	Source:	TX ~	8b10b ~	LSS Phase:	Set Trigger	No Acq
Trigger	Bus	Data Rate:	2.5	Gbps	Trigger on LSS Phase 1 (TRG_UPR_0) $$	Set myyer	Run / Stop
		Trigger On:	Link Startup S	equence (LSS) V			Run Options
	Software	Level:	0	V			Analyze
	🗌 NRZ	RD:	RDN ~				Export
Version :1.4.3							Report

PGY-UniPRO/LLI/UFS software provides protocol aware trigger conditions such as link start-up sequence, PHY adapter layer content and data link layer content. The unique capabilities in this software allow trigger data types such as PWM, NRZ or 8B/10B serial data of the protocol. PGY-UniPRO supports the following Protocol Aware Trigger capabilities.

Trigger Event	Trigger Content
Link Startup Sequence (LSS)	Trigger on LSS Phase 1 (TRG_UPR_0) Trigger on LSS Phase 2 (TRG_UPR_1)
	Trigger on LSS Phase 3 (TRG_UPR_2)
	PACP_PWR_req
	PACP_PWR_cnf
	PACP_cap_ind
	PACP_EPR_ind
PHY Adapter layer Content	PACP_TEST_MODE_req
	PACP_GET_req
	PACP_GET_cnf
	PACP_SET_req
	PACP_SET_cnf
	PACP_Test_Data
	Data_SOF
Data Link layer Content	Data_COF
	AFC (Acknowledgement)
	NAC (No Acknowledgement)



PGY-UFS is module is an optional module to PGY-UniPRO software, which provides protocol decode of UFS content present in the Data Link layer packet. PGY-UFS software extracts UFS information present in the data link packet and displays it in UFS Protocol Information Unit (UPIU). PGY-UFS has the flexibility of displaying only UFS protocol content or UFS and UniPRO data for easy debugging purposes.

1:Not Set	M2 : Not Set	∆T : Not Set	- 7						F	Packet	Details							
earch \ Filter				15	14 13	12	11	10	9	8	7	6	5	4	3	2	1	0
earch					ESC_DL = 0x01							SOF = 0x0 TC			TC0 = 0x0 Reserved = 0x			
			Reset	DL	SDU-Byte0	= 0x01					DL_SDU-Byte1 = 0x0e							
		•		DL	SDU-Byte2	= 0x0a					DL_	SDU-B	/te3 = 0	x14				
Timestamp	Direction	Packet	^	DL.	SDU-Byte4	= 0x80					DL_	SDU-B	rte5 = 0	xe2				
5.8780 µS	DL_SDU-Byte6 = 0x0a							DL_SDU-Byte7 = 0x1e										
5.8980 µS	Tx \longrightarrow Rx Tx \longrightarrow Rx	Start_Of_Burst MARKER 1			SDU-Byte8							SDU-B						
5.9080 µS	Tx> Rx	UNKNOWN	2	_	SDU-Byte10						_	SDU-By						
6.0380 µS	Tx 🗪 Rx	DL DATA			SDU-Byte12						-	SDU-By						
6.0580 µS	Tx 🗪 Rx	UNKNOWN		-	SDU-Byte 14						-	SDU-By						
6.0680 µS	Tx 🗪 Rx	UNKNOWN			SDU-Byte16							SDU-By						
6.0980 µS	Tx 🗪 Rx	UNKNOWN			SDU-Byte 18						101010000	SDU-By						
6.1780 µS	Tx 🗪 Rx	UNKNOWN		_	SDU-Byte20							SDU-By						
6.1880 µS	Tx 🗪 Rx	UNKNOWN			ESC_DL = 0	JXDC	00	0.20			-	EVEN			Frame Se	eq. Nur	mber = (Jx01
6.1980 µS	Tx 🗪 Rx	MARKER_1					CR	0-10 = (JX55555	(rail, C	omputed	CRC-I	o = uxa	199)				
6.2080 µS	Tx 🗪 Rx	End_Of_Burst																
6.2180 µS	Tx 🗪 Rx	End_Of_Burst																
6.3081 µS	Tx 🗪 Rx	Start_Of_Burst																
6.3281 μS	Tx 🗪 Rx	DL_DATA																
6.4681 µS	Tx 🗪 Rx	UNKNOWN																
6.4781 µS	Tx 📥 Rx	UNKNOWN	~															

Tektronix Oscilloscopes Supported

- DPO/MSO/DSA 70000 series
- MSO5 series, MSO6 series

All need to be windows 7 or higher OS based

Ordering Information:

PGY-UniPRO MIPI-MPHY-UniPro Protocol Decode Software.

PGY-LLI MIPI-MPHY-LLI Protocol Decode Software.

PGY-UFS MIPI-UFS Protocol decode Software (Pre-requisite PGY-UniPRO).

(Shipment includes CD with PGY- software and license key)



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.