

The Importance of Quality for 100 and 400 Gbit Optical TAPs

WHITE PAPER

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Network visibility starts with Layer 1 and quality is an important consideration. Top quality components at this layer are vital to providing reliable data to all other applications. This means that rigorous testing and quality assurance for optical TAPs is a must. This is particularly true when considering bandwidth speeds of 100 Gbit and 400 Gbit links where the optical light budget is lower than on 10 Gbit and 1 Gbit links. Another major consideration is the fact that multiple fibers are used to construct the physical link for these bandwidth speeds. Therefore, it is also very important that these fibers have a very similar optical power.

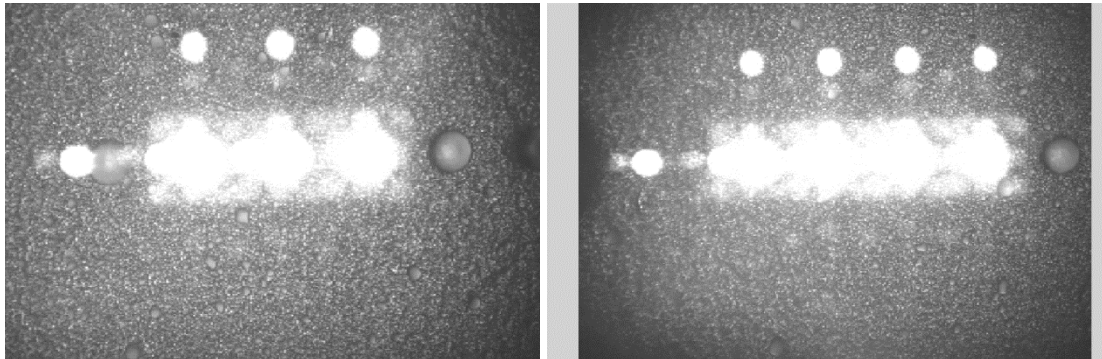
Achieving this level of quality assurance with a standard power meter is nearly impossible since all 4 fiber pairs must be measured at the same time.



Cubro has developed a proprietary measurement device (1), that can measure up to 4 fiber pairs simultaneously, using all bandwidth speeds and all wavelength frequencies. This measurement method is not only very fast but produces repeatable results on each link; this is not often the case with standard optical power meters. The reason for this is that optical power meters are normally designed to measure longer optical fibers and not those of a very short distance.

The second key process for quality assurance is to visually inspect every connector for any contaminants or defects. We employ a fiber microscope (2) to accomplish this task. We even save a photo of each connector in a database for later reference and analysis in case a customer experiences an issue.

A visual inspection is also critical to ensure that all fibers in a connector are functioning. In the photos below we can see a properly functioning connector on the right where all fibers are lit; on the left is a faulty connector where one of the fiber pairs is dark.



If a vendor, in the interest of saving time and expense, tests only a handful of fibers on the TAP or samples from a batch of products for QA, it could mean unforeseen issues for the customer. This is made even more serious when one considers that installation of a TAP requires scheduled downtime of the link. Cubro tests all fibers at all bandwidths and all wavelengths to ensure a quality experience for the customer.

A		B		C		D		H		I		J		K		O		P		Q		R		S		W		X		Y		Z	
Seriennummer:				19042001				Messgerät:				OPTOMAT				User:				ADA													
Datum				14.06.2018 11:37				Fußbutton				Kalibration																					
AVERP		CBD-00033		Optical TAP SM Splitting Ratio 70/30																													
	IN	OUT	MON		IN	OUT	MON		IN	OUT	MON		IN	OUT	MON		IN	OUT	MON		IN	OUT	MON		IN	OUT	MON		IN	OUT	MON		
	LINK		MON		LINK		MON		LINK		MON		LINK		MON		LINK		MON		LINK		MON		LINK		MON		LINK		MON		
Splitter1	AWV	AEΛ	AW	1310nm SM	AWV	AEΛ	AW	1550nm SM	Splitter9	EWV	EEΛ	EW		EWV	EEΛ	EW		EWV	EEΛ	EW		EWV	EEΛ	EW		EWV	EEΛ	EW		EWV	EEΛ	EW	
	IN	1,69	5,63	70/30	IN	1,72	5,45	70/30		IN				IN				IN				IN				IN				IN			
Splitter2	AEV	AWΛ	AE	1310nm SM	AEV	AWΛ	AE	1550nm SM	Splitter10	EEV	EWΛ	EE		EEV	EWΛ	EE		EEV	EWΛ	EE		EEV	EWΛ	EE		EEV	EWΛ	EE		EEV	EWΛ	EE	
	IN	1,64	5,39	70/30	IN	1,745	5,24	70/30		IN				IN				IN				IN				IN				IN			
Splitter3	BWV	BEΛ	BW	1310nm SM	BWV	BEΛ	BW	1550nm SM	Splitter11	FWV	FEΛ	FW		FWV	FEΛ	FW		FWV	FEΛ	FW		FWV	FEΛ	FW		FWV	FEΛ	FW		FWV	FEΛ	FW	
	IN	1,91	5,39	70/30	IN	1,744	5,63	70/30		IN				IN				IN				IN				IN				IN			
Splitter4	BEV	BWΛ	BE	1310nm SM	BEV	BWΛ	BE	1550nm SM	Splitter12	FEV	FWΛ	FE		FEV	FWΛ	FE		FEV	FWΛ	FE		FEV	FWΛ	FE		FEV	FWΛ	FE		FEV	FWΛ	FE	
	IN	1,72	5,49	70/30	IN	1,727	5,33	70/30		IN				IN				IN				IN				IN				IN			
Splitter5	CWV	CEΛ	CW	1310nm SM	CWV	CEΛ	CW	1550nm SM	Splitter13	GEV	GEΛ	GE		GEV	GEΛ	GE		GEV	GEΛ	GE		GEV	GEΛ	GE		GEV	GEΛ	GE		GEV	GEΛ	GE	
	IN	1,7	5,28	70/30	IN	1,669	5,29	70/30		IN				IN				IN				IN				IN				IN			
Splitter6	CEV	CWΛ	CE	1310nm SM	CEV	CWΛ	CE	1550nm SM	Splitter14	HEV	HEΛ	HE		HEV	HEΛ	HE		HEV	HEΛ	HE		HEV	HEΛ	HE		HEV	HEΛ	HE		HEV	HEΛ	HE	
	IN	1,67	5,29	70/30	IN	1,695	5,28	70/30		IN				IN				IN				IN				IN				IN			
Splitter7	DWV	DEΛ	DW	1310nm SM	DWV	DEΛ	DW	1550nm SM	Splitter15	HEV	HEΛ	HE		HEV	HEΛ	HE		HEV	HEΛ	HE		HEV	HEΛ	HE		HEV	HEΛ	HE		HEV	HEΛ	HE	
	IN	1,66	5,47	70/30	IN	1,72	5,36	70/30		IN				IN				IN				IN				IN				IN			
Splitter8	DEV	DWΛ	DE	1310nm SM	DEV	DWΛ	DE	1550nm SM	Splitter16	HEV	HEΛ	HE		HEV	HEΛ	HE		HEV	HEΛ	HE		HEV	HEΛ	HE		HEV	HEΛ	HE		HEV	HEΛ	HE	
	IN	1,92	5,59	70/30	IN	1,964	5,57	70/30		IN				IN				IN				IN				IN				IN			

Cubro includes the test results for our measurement protocol with every optical TAP. For a small additional fee, Cubro will provide the microscope photos of each connector on the TAP as well.



TEST DATA

Name: Optical TAP SM Splitting Ratio 70/30
 SN: 19042001

Fibre-Type	SM				SM				SM				SM																																			
	70/30								70/30								70/30								70/30																							
	A-W		A-E		B-W		B-E		C-W		C-E		D-W		D-E		E-W		E-E		F-W		F-E		G-W		G-E		H-W		H-E																	
Port	Link	Mon.	Link	Mon.	Link	Mon.	Link	Mon.	Link	Mon.	Link	Mon.	Link	Mon.	Link	Mon.	Link	Mon.	Link	Mon.	Link	Mon.	Link	Mon.	Link	Mon.	Link	Mon.	Link	Mon.																		
Insertion Loss	1,7		5,6		1,6		5,4		1,9		5,4		1,7		5,5		1,7		5,3		1,7		5,3		1,7		5,5		1,9		5,6																	
Wavelength	1310								1310								1310								1310																							
Insertion Loss	1,7		5,5		1,7		5,2		1,7		5,6		1,7		5,3		1,7		5,3		1,7		5,4		2,0		5,6																					
Wavelength	1550								1550								1550								1550																							
Return Loss	> 45																																															
Directivity	>50																																															
Connector	LC/UPC																																															
Operating Temperature	-10~+70°																																															

Tested By: ADA

TEST DATE: 14.06.2018

USED EQUIPMENT : Optomat
 SN : 1
 CALIBRATION DATE : 14.06.2018 11:43

[Watch the Video: Optical TAP testing with the self-developed test gear](#)

About Cubro Network Visibility:

Cubro Network Visibility is among the leading vendors of Network Probes, Network Packet Brokers (NPBs), and Network TAPs (Test Access Points), a partner of the world’s largest Telecommunications company, and has installations in enterprises on all continents. We offer a complete portfolio of network visibility products that can help organisations gain insight into their network traffic. We have a global reach with customers located in Europe, Asia, Japan, the Middle East, and North America. For more information check our website www.cubro.com or contact us at support@cubro.com.