

# SmartProtocol PC Software

## **INSTRUCTION MANUAL**

	Selection Generate Protocol	etup Help									
Loss Testing Pepert				english.h	ng		-				
Operator: Ba	adomil Kolátor		Date: 832011	czech.ln	g						
				english.lr	ng						
Company: OF	PTOKON Co., Ltd										
Trace: OF	PTOKON - JIHLAVA						6307-064				
Power Meter:	4800 PM80010	03					OPT	KON			
Route: Ca	able house			Date:	19.6.2007		Q	~ .	PTOKON	Co., Ltd.	
-				Operator:	Magda Rys	chnovská		E	E-mail: OPT	OKON@OF	TOKON
End A: Jor	TUKUN	End B: JUNDAVA		Company:	OPTOKON	/ Co., Ltd., :	spol. s r.o.		88		_
		Fiber Length [m]:		Loss Testi	ng Report						
No. of Splices:		Splice Loss [dB]:		Tanan		-	OPTOKON	Cable Main			
No. of Connectors:		Connector Loss [dB]:		Poute:			OPTOKON	Cable Hous	e - Zhojmo		
				Fod A			OPTOKON	cable nous	End B		lihlev
No. of Passive Devices:		Passive Device Loss [dB]:		Prover Me	ator		PM420 PM	1207/000	Eiber Lenn	the	8000
	_			No. of Sul	Lone		10	10/000	College Log		0100
Way Data Selection				no. or op	ICCO.				oplice cos		0.7 00
			the second se	No of Co	mandam		2		Connenter	the second	O E dO
				No. of Co	nnectors:	201	2		Connector	Loss:	0.5 dB
Measurem	ent			No. of Co No. of Par	nnectors: ssive Devic	es:	2 0		Connector Passive D	Loss: evice:	0.5 dB 3.6 dB
Measurem • Two si	ient ide C One side	Wavelength	: 1310 nm 💌	No. of Co No. of Par Fiber Atte	nnectors: ssive Device nuation 131	es: 10 nm:	2 0 0.35 dB/km		Connector Passive D Loss Limit	·Loss: evice: 1310 nm:	0.5 dB 3.6 dB 4.80 d
Measurem • Two si	ient ide C One side	Wavelength	: 1310 nm 💌	No. of Co No. of Par Fiber Atte Fiber Atte	nnectors: ssive Device nuation 131 nuation 155	es: 10 nm: 50 nm:	2 0 0.35 dB/km 0.20 dB/km		Connector Passive D Loss Limit Loss Limit	-Loss: evice: 1310 nm: 1550 nm:	0.5 dB 3.6 dB 4.80 d 3.60 d
Measurem Two si Recorded Da	ient C Dne side sta	Wavelength Direction A>8	: 1310 nm 💌 Direction B->A	No. of Co No. of Pa Fiber Atte Fiber Atte	nnectors: ssive Device nuation 131 nuation 155	es: 10 nm: 50 nm:	2 0 0.35 dB/km 0.20 dB/km		Connector Passive D Loss Limit Loss Limit	"Loss: evice: 1310 nm: 1550 nm:	0.5 dB 3.6 dB 4.80 d 3.60 d
Measurem Two si Recorded Da Position V.	ent ide C One side ata	Direction A>B	: 1310 nm	No. of Co No. of Par Fiber Atte Fiber Atte	nnectors: ssive Device nuation 131 nuation 155 leasured Va	es: 10 nm: 50 nm: Jues	2 0 0.35 dB/km 0.20 dB/km		Connector Passive D Loss Limit Loss Limit	-Loss: evice: 1310 nm: 1550 nm:	0.5 dB 3.6 dB 4.80 d 3.60 d
Measurem Two si Recorded Da Position V. 1/1 4.	ent ide C One side ata alue Add A->B	Wavelength Direction A>B	: 1310 nm Direction B->A Position Value	No. of Co No. of Par Fiber Atte Fiber Atte	nnectors: ssive Device nuation 131 nuation 155 leasured Va	es: 10 nm: 50 nm: Iues	2 0 0 35 dB/km 0 20 dB/km		Connector Passive D Loss Limit Loss Limit	Loss: evice: 1310 nm: 1550 nm:	0.5 dB 3.6 dB 4.80 d 3.60 d
Measurem           © Two si           Recorded De           Position           1/1           4,           1/2           4,	ent ide C One side alue Add A->B .32 .43 .59 E Add B->A	Wavelength Direction A>B	: 1310 nm Direction B->A Position Value	No. of Co No. of Par Fiber Atte Fiber Atte Table of M	nnectors: ssive Device nuation 131 nuation 155 leasured Va Los	es: 10 nm: 50 nm: lues <u>is (dB) 1310</u>	2 0 0.35 dB/km 0.20 dB/km 0.20 dB/km	Los	Connector Passive D Loss Limit Loss Limit	Loss: evice: 1310 nm: 1550 nm:	0.5 dB 3.6 dB 4.80 d 3.60 d
Measurem           © Two si           Recorded De           Position           1/1           4,           1/3           1/4	ent ide C One side alue Add A->B 43 59 12 Add B->A	Wavelength Direction A->B Position Value	( 1310 nm Direction B->A Position Value	No. of Co No. of Par Fiber Atte Table of M	nnectors: ssive Device nuation 131 nuation 155 leasured Va	es: 10 nm: 50 nm: lues (dB) 1310 B-A	2 0 0.35 dB/km 0.20 dB/km 0.nm Avg.	Los A-B	Connector Passive D Loss Limit Loss Limit Loss Limit as [dB] 1550 B-A	Loss: evice: 1310 nm: 1550 nm: 0 nm Avg.	0.5 d8 3.6 d8 4.80 d 3.60 d
Measurem           © Two si           Recorded Da           Position V,           1/1           1/2           1/3           4,           1/4           1/5	ent ide C One side ata alue Add A->B 43 E Add B->A 12 E 52 E	Direction A->B	i 1310 nm 💌 Direction B->A Position Value	No. of Co No. of Par Fiber Atte Fiber Atte Table of M Fiber 1.	nnectors: ssive Device nuation 131 nuation 155 easured Va Los A-B 4.32 4.43	es: 10 nm: 50 nm: Jues (dB) 1310 B-A 4.24 4.41	2 0 0.35 dB/km 0.20 dB/km 0.00 nm Avg. 4.28 4.42	Los A-B 3.48 3.56	Connector Passive D Loss Limit Loss Limit as [dB] 1550 B-A 3.42 3.51	Loss: evice: 1310 nm: 1550 nm: 0 nm Avg. 3.45 3.54	0.5 dB 3.6 dB 4.80 d 3.60 d Note PASS PASS
Measurem           © Two si           Recorded Date           Position           1/1           4           1/2           4           1/3           4           1/4           1/5           4           1/6           4           1/7	ent ide One side ata alue Add A->B 43 E 59 E 12 52 82 15 (	Direction A->8	a 1310 nm 🗨	No. of Co No. of Par Fiber Atte Fiber Atte Table of M Fiber 1. 2. 3.	nnectors: ssive Device nuation 131 nuation 155 leasured Va Los A-B 4.32 4.43 4.59	es: 10 nm: 50 nm: lues 14 (dB) 1310 B-A 4.24 4.41 4.47	2 0 0.35 dB/km 0.20 dB/km 0.20 dB/km 4.42 4.42 4.53	Los A-B 3.48 3.56 3.26	Connector Passive D Loss Limit Loss Limit B-A 3.42 3.51 3.22	Loss: evice: 1310 nm: 1550 nm: Avg. 3,45 3,54 3,54 3,24	0.5 df 3.6 df 4.80 d 3.60 d Note PAS PAS
Measurem           © Two si           Recorded Date           Position           1/1           4,           1/2           4,           1/3           4,           1/4           4,           1/6           4,           1/7           4,           1/6           4,           1/7           4,           1/6           4,           1/8	ent ide C One side ata alue A 43 59 E 52 82 82 15 26 20 20 20 20 20 20 20 20 20 20 20 20 20	Direction A>B	: 1310 nm	No. of Co No. of Par Fiber Atte Table of M Fiber 1. 2. 3. 4.	nnectors: ssive Device nuation 131 nuation 155 leasured Va Los A.B 4.32 4.32 4.32 4.59 4.12	es: 10 nm: 50 nm: lues 8-A 4.24 4.41 4.41 4.47 4.21	2 0 0.35 dB/km 0.20 dB/km Avg. 4.82 4.82 4.53 4.17	Los A-B 3.48 3.56 3.26 3.28	Connector Passive D Loss Limit Loss Limit B-A 3.42 3.51 3.22 3.18	Loss: evice: 1310 nm. 1550 nm. 1550 nm. Avg. 345 354 324 323	0.5 db 3.6 db 4.80 d 3.60 d Note PAS PAS PAS
Measurem           © Two si           Recorded Date           Position         V.           1/1         4.           1/2         4.           1/3         4.           1/4         4.           1/5         4.           1/6         4.           1/7         4.           1/8         4.           1/9         4.	ent ide C One side alue A 32 43 59 12 52 82 15 26 38 60 C One side Add A->B Add B->A C One side Add B->A	Direction A>8	: 1310 nm	No. of Co No. of Par Fiber Atte Table of M Fiber 1. 2. 3. 4. 5.	nnectors: ssive Device nuation 131 nuation 155 easured Va Los A.B 4.32 4.32 4.32 4.59 4.12 4.52	es: 10 nm: 50 nm: lues 8.6(B) 1310 8.4 4.24 4.24 4.41 4.47 4.21 4.54	2 0 0.35 dB/km 0.20 dB/km 0.20 dB/km Avg. 4.28 4.42 4.53	Los A-B 3.48 3.26 3.26 3.28 3.33	Connector Passive D Loss Limit Loss Limit B-A 3.42 3.51 3.22 3.18 3.31	Loss: evice: 1310 nm: 1550 nm: 1550 nm: Avg. 3.45 3.54 3.24 3.23 3.32	0.5 dl 3.6 dl 4.80 d 3.60 d PAS PAS PAS PAS
Measurem           Image: Two si           Recorded Date           Position           V11           V12           1/2           1/3           1/4           1/5           4           1/6           1/7           1/8           1/10           1/10           1/11	ent ide C One side ata alue ^ 43 = Add A→B 43 = Add B→A 12 52 15 26 28 28 28 28 28 28 28 28 28 28	Direction A->B Position Value	i 1310 nm 🗨 Direction B->A Position Value	No. of Co No. of Pa Fiber Atte Table of M Fiber 1. 2. 3. 4. 5. 5. 6.	nnectors: ssive Device nuation 131 nuation 155 easured Va Los A-B 4.32 4.43 4.59 4.12 4.52 4.82	es: 10 nm: 30 nm: 10 ues 10 lues 10 lues 1	2 0 0.35 dB/km 0.20 dB/km 0.20 dB/km 4.28 4.42 4.53 4.53 4.53 4.81	Los A-B 3.48 3.56 3.26 3.28 3.33 3.68	Connector Passive D Loss Limit Loss Limit B-A 3.42 3.51 3.22 3.18 3.31 3.72	Loss: evice: 1310 nm: 1550 nm: 1550 nm: Avg. 3.45 3.54 3.24 3.23 3.32 3.32 3.70	0.5 dl 3.6 dl 4.80 d 3.60 d PAS PAS PAS PAS FAI
Measurem           © Two si           Recorded Date           Position           V11           1/2           4,           1/3           4,           1/6           4,           1/6           4,           1/7           1/8           4,           1/7           1/8           4,           1/10           4,           1/11           4,	ent ide C One side ata alue 52 53 54 52 82 82 82 88 88 81 1 • Remove All	Direction A->B	a 1310 nm	No. of Co No. of Pa Fiber Atte Table of M Fiber 1. 2. 3. 4. 5. 6. 7.	nnectors: ssive Device nuation 131 nuation 155 leasured Va Los A.B 4.32 4.43 4.59 4.12 4.52 4.82 4.52 4.82 4.15	es: 10 nm: 50 nm: 1005 100	2 0 0.35 dB/km 0.20 dB/km Avg. 4.28 4.42 4.53 4.17 4.53 4.17 4.53 4.81 4.20	Los A-B 3.48 3.56 3.26 3.33 3.68 3.33 3.68 3.24	Connector Passive D Loss Limit Loss Limit B-A 3.42 3.51 3.22 3.18 3.31 3.72 3.26	Loss: evice: 1310 nm: 1550 nm: 1550 nm: Avg. 3.45 3.54 3.24 3.23 3.22 3.70 3.25	0.5 dl 3.6 dl 4.80 d 3.60 d 9.60 d PAS PAS PAS PAS PAS PAS
Measurem           © Two si           Recorded Date           Position           V.1/1           1/2           4, 1/2           1/3           4, 1/2           1/4           1/5           4, 1/5           1/6           4, 1/7           1/8           1/9           4, 1/10           1/11           4	ent ide C One side ata alue A 32 43 59 52 52 82 15 55 88 15 68 11 • Remove All	Direction A->B	: 1310 nm	No. of Co No. of Par Fiber Atte Table of M Fiber 1. 2. 3. 4. 5. 6. 7. 8. 8.	nnectors: ssive Device nuation 131 nuation 155 leasured Va Los A.B 4.32 4.43 4.59 4.12 4.59 4.12 4.52 4.82 4.15 4.82 4.15	es: 10 nm: 50 nm: 1ues 1ues 1424 1424 1424 1424 1424 1424 1424 1425 125 125 125 125 125 125 125 1	2 0 0.35 dB/km 0.20 dB/km 0.20 dB/km 4.02 4.42 4.53 4.17 4.53 4.17 4.53 4.17 4.53 4.17 4.53 4.81 4.20 4.20	Los A-B 3.48 3.56 3.26 3.28 3.32 3.368 3.24 3.24 3.24	Connector Passive D Loss Limit Loss Limit B-A 3.51 3.22 3.51 3.22 3.18 3.31 3.72 3.28 3.34	Loss: evice: 1310 nm: 1550 nm: 1550 nm: Avg. 345 354 324 323 322 332 332 332 325 341 325	0.5 dl 3.6 dl 4.80 d 3.60 d 9.60 d PAS PAS PAS PAS PAS PAS PAS
Measurem           © Two si           Recorded Date           Position         V.           1/1         4.           1/2         4.           1/3         4.           1/4         4.           1/5         4.           1/6         4.           1/7         4.           1/8         4.           1/9         4.           1/10         4.           1/11         4.	ent ide C One side ata alue Add A->B 32 43 59 12 52 82 82 15 68 81 • Remove All	Direction A>8	: 1310 nm	No. of Co No. of Par Fiber Atte Fiber Atte Table of M Fiber 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	nnectors: ssive Device nuation 131 nuation 155 leasured Va Los A-B 4.32 4.43 4.52 4.52 4.52 4.52 4.52 4.52 4.52 4.52	es: 10 nm: 50 nm: lues 145 146 1310 8-A 4.24 4.41 4.47 4.21 4.54 4.54 4.54 4.25 4.26 4.35 4.45 4.26 4.35 4.45 4	2 0.35 dB/km 0.20 dB/km 0.20 dB/km 4.28 4.42 4.53 4.17 4.53 4.81 4.20 4.26 4.37 4.53	Los A-B 3.49 3.56 3.26 3.33 3.68 3.24 3.41 3.27 5	Connector Passive D Loss Limit Loss Limit B-A 3.42 3.51 3.22 3.18 3.31 3.72 3.26 3.41 3.22 3.21	Loss: evice: 1310 nm: 1550 nm: 1550 nm: Avg. 3.45 3.54 3.24 3.23 3.32 3.70 3.25 3.41 3.27 3.27 3.27	0.5 dl 3.6 dl 4.80 3.60 Not PAS PAS PAS PAS PAS PAS PAS
Measurem           Two si           Recorded Date           Position         V.           1/1         4.           1/2         4.           1/3         4.           1/4         4.           1/6         4.           1/7         4.           1/6         4.           1/7         4.           1/8         4.           1/9         4.           1/10         4.           1/11         4.           ✓         III	ent ide One side ata alue 43 59 12 52 15 26 28 28 11 • Remove All	Direction A->B	a 1310 nm ▼ Direction B->A Position Value	No. of Co No. of Pa Fiber Atte Fiber Atte Table of M Fiber 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11	nnectors: ssive Device nuation 131 nuation 155 leasured Va Los A-B 4.32 4.43 4.59 4.12 4.52 4.82 4.52 4.82 4.15 4.26 4.38 4.68 4.51	es: 10 nm: 50 nm: 10es 10es 10es 10es 10es 10es 10es 10es	2 0 0.35 dB/km 0.20 dB/km 0.20 dB/km Avg. 4.28 4.42 4.53 4.17 4.53 4.17 4.53 4.81 4.20 4.20 4.20 4.23 4.37 4.58 4.17	Los A-B 3.48 3.56 3.26 3.28 3.33 3.68 3.24 3.27 3.75 3.77	Connector Passive D Loss Limit Loss Limit B-A 3.42 3.51 3.22 3.18 3.31 3.72 3.26 3.41 3.27 3.21 3.27 3.51 3.27 3.51 3.27 3.51 3.27 3.51 3.27 3.51	Loss: evice: 1310 nm: 1550 nm: Arg. 3.45 3.54 3.24 3.23 3.32 3.32 3.32 3.370 3.25 3.341 3.27 3.63 3.27 3.63 3.23	0.5 dl 3.6 dl 4.80 3.60 3.60 PAS PAS PAS PAS PAS PAS FAI PAS FAI PAS
Measurem           © Two si           Recorded Date           Position         V.           1/1         4.           1/2         4.           1/3         4.           1/4         4.           1/6         4.           1/7         4.           1/6         4.           1/7         4.           1/7         4.           1/7         4.           1/8         4.           1/9         4.           1/10         4.           1/11         4.            III	ent ide One side ata alue 52 53 54 52 82 82 15 26 88 88 88 11 • • • • • • • • • • • • • •	Direction A->8	a 1310 nm	No. of Co No. of Pa Fiber Atte Fiber Atte Table of M Fiber 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12	nnectors: ssive Device nuation 131 nuation 155 easured Va easured Va Los A-B 4.32 4.43 4.59 4.12 4.59 4.12 4.59 4.12 4.59 4.12 4.59 4.12 4.59 4.12 4.59 4.12 4.59 4.15 4.68 4.68 4.61 4.37	es: 10 nm: 50 nm: lues lues 14 4.47 4.24 4.47 4.24 4.47 4.21 4.24 4.47 4.21 4.25 4.26 4.35 4.48 4.35 4.48 4.13 4.24	2 0 0.35 dB/km 0.20 dB/km 0.20 dB/km 4.02 4.53 4.17 4.53 4.17 4.53 4.17 4.53 4.17 4.53 4.17 4.53 4.11 4.20 4.26 4.37 4.58 4.12 4.30	Los A·B 3.48 3.26 3.28 3.28 3.28 3.24 3.41 3.24 3.41 3.27 3.75 3.27 3.75 3.27	Connector Passive D Loss Limit Loss Limit Loss Limit B-A 3.42 3.51 3.22 3.18 3.31 3.72 3.26 3.41 3.27 3.26 3.41 3.27 3.51 3.48 3.48	Loss: evice: 1310 nm: 1550 nm: Avg. 3.54 3.54 3.24 3.23 3.24 3.23 3.24 3.23 3.25 3.41 3.27 3.63 3.23 3.54	0.5 dl 3.6 dl 4.80 ( 3.60 ( 3.60 ( 9.60 ( 9.
Measurem           © Two si           Recorded Date           Position         V.           1/1         4.           1/2         4.           1/3         4.           1/6         4.           1/7         4.           1/7         4.           1/7         4.           1/7         4.           1/7         4.           1/7         4.           1/7         4.           1/7         4.           1/10         4.           1/11         4.            III	ent ide C One side ata alue 32 43 55 52 52 82 15 26 83 84 84 84 84 84 84 84 84 84 84	Direction A->B         Position       Value         Image: Image	: 1310 nm	No. of Co No. of Par Fiber Atte Fiber Atte Table of M Fiber 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 0. 2. 2. 2. 2. 2. 3. 4. 5. 5. 6. 7. 7. 8. 9. 10. 10. 10. 10. 10. 10. 10. 10. 10. 10	nnectors: ssive Device nuation 131 nuation 155 easured Va Los A.B 4.32 4.43 4.59 4.12 4.52 4.52 4.52 4.52 4.52 4.52 4.52 4.5	es: 10 nm: 50 nm: 10es 10es 10es 10es 10es 10es 10es 1310 8-A 4.24 4.41 4.41 4.41 4.41 4.25 4.26 4.35 4.26 4.35 4.13 4.24 4.31 4.25 4.26 4.35 4.35 4.35 4.35 4.37 4.37 4.35 4.37 4.37 4.37 4.35 4.35 4.35 4.37 4.37 4.37 4.35 4.35 4.35 4.35 4.37 4.37 4.37 4.35 4.35 4.35 4.35 4.35 4.35 4.35 4.35 4.35 4.37 4.37 4.37 4.37 4.35	2 0.35 dB/km 0.20 dB/km 0.20 dB/km 4.28 4.42 4.53 4.17 4.53 4.17 4.53 4.17 4.53 4.17 4.26 4.37 4.26 4.37 4.58 4.12 4.30 4.30	Los A-B 3.48 3.26 3.29 3.33 3.68 3.24 3.41 3.27 3.75 3.27 3.59 3.43	Connector Passive D Loss Limit Loss Limit Loss Limit B-A 3.42 3.51 3.22 3.18 3.34 3.22 3.28 3.41 3.22 3.51 3.18 3.41 3.28 3.41 3.28 3.41 3.28 3.41 3.28 3.41 3.41 3.41 3.41 3.41 3.41 3.41 3.41	Loss: evice: 1310 nm. 1550 nm. 1550 nm. 345 354 324 323 332 332 332 332 341 327 363 323 323 341 323 341 323 341 323 354	0.5 dk 3.6 dk 4.80 d 3.60 d 3.60 d PAS PAS PAS PAS PAS PAS FAII PAS FAII PAS
Measurem           © Two si           Recorded Date           Position         V.           1/1         4.           1/2         4.           1/3         4.           1/4         4.           1/6         4.           1/7         4.           1/7         4.           1/8         4.           1/9         4.           1/10         4.           1/11         4.            IIII	ent ide C One side ata alue ^ 43 53 52 52 52 52 53 52 52 53 52 53 52 52 53 52 53 52 52 53 52 53 52 53 52 53 52 53 52 52 53 53 53 52 53 53 52 53 52 53 53 52 53 53 52 53 52 53 52 53 53 53 52 52 53 53 53 54 54 54 54 54 54 54 54 54 54	Vavelength Direction A->B Position Value	: 1310 nm	No. of Co No. of Par Fiber Atte Fiber Atte Table of M Fiber 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 4. 2. 7. 8. 9. 10. 11. 12. 4. 7. 7. 8. 9. 10. 11. 12. 10. 11. 12. 10. 11. 12. 10. 10. 10. 10. 10. 10. 10. 10. 10. 10	nnectors: ssive Device nuation 131 nuation 155 easured Va Los A-B 4.32 4.43 4.59 4.12 4.52 4.82 4.15 4.26 4.38 4.68 4.15 4.26 4.38 4.68 4.61 4.37 4.42	es: 10 nm: 50 nm: lues (dB) 1310 B-A 4.24 4.24 4.41 4.41 4.41 4.41 4.41 4.41	2 0 0.35 dB/km 0.20 dB/km 0.20 dB/km 4.02 4.42 4.53 4.17 4.53 4.17 4.53 4.17 4.53 4.81 4.20 4.26 4.37 4.58 4.37 4.58 4.32 4.32 4.32	Los A-B 3.45 3.26 3.26 3.23 3.33 3.68 3.24 3.41 3.27 3.75 3.27 3.59 3.43 3.45	Connector Passive D Loss Limit Loss Limit B-A 3.42 3.51 3.22 3.18 3.31 3.72 3.23 3.41 3.27 3.51 3.21 3.21 3.21 3.21 3.21 3.21 3.21 3.2	Loss: evice: 1310 nm. 1550 nm. Avg. 345 354 324 323 322 3370 325 341 327 363 327 363 327 363 327 363 327 363 327 354 340 370	0.5 d 3.6 d 4.80 3.60 PAS PAS PAS PAS PAS FAI PAS FAI PAS

is a registered trademark of OPTOKON, a.s. Other names and trademarks referred to herein may be the trademarks of their respective owners. OPTOKON, a.s., Cerveny Kriz 250, 586 02 Jihlava, Czech Republic

tel. +420 564 040 111, fax +420 564 040 134, WWW.OPTOKON.COM, INFO@OPTOKON.CZ



is the registered trademark of OPTOKON, a.s. Other names and trademarks stated herein may be the trademarks of their respective owners

All rights reserved. No parts of this work may be reproduced in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping or information storage and retrieval systems - without the written permission of the publisher.

Products that are referred to in this document may be either trademarks and/or registered trademarks of the respective owners. The publisher and the author make no claim to these trademarks.

While every precaution has been taken in the preparation of this document, the publisher and the author assume no responsibility for errors or omissions, or for damage resulting from the use of information contained in this document or from the use of programs and source codes that may accompany it. Under no circumstances shall the publisher and the author be liable for any loss of profit or any other commercial damage caused or alleged to have been caused directly or indirectly by this document.

#### **OPTOKON**, a.s.

Cerveny Kriz 250 586 01 Jihlava Czech Republic

tel. +420 564 040 111 fax +420 564 040 134

WWW.OPTOKON.COM INFO@OPTOKON.CZ

## Contents

1	Intr	oduc	tion	4
2	Pre	parin	g the connection	5
3	Sma	artPr	otocol	9
	3.1	Star	ting SmartProtocol – Main screen	9
	3.2	Sett	ing the serial port and language	10
	3.3	Rec	ording data – PM-800, OFT-820, PM-212	
	3.3.	1	From Meter	
	3.3.	2	From TXT file	
	3.3.	3	Selecting data	
	3.4	Rec	ording data – PM-830	15
	3.4.	1	Selecting data	15
	3.5	Crea	ating a loss test report	
	3.6	Prot	cocol management	
4	Cali	brati	on, OPTOKON service center	20

## **1** Introduction

SmartProtocol software is a flexible solution for data capture, analysis and reporting of fiber optic loss.

It is optimized for the following OPTOKON test instruments: PM-212, PM-800, OFT-820, PM-830.

#### Features

- One-sided or two-sided measurement.
- Data recording from internal instrument or TXT file memory.
- Creation of test protocols from recorded data.
- Recording instrument serial numbers.
- Reports can be imported or saved in TXT format for compatibility with other applications (Word, Excel).
- Pass / Fail assessment.
- High productivity.
- Easy language or report customisation.
- Detailed heading.
- Simple operating and editing of protocols.

#### Application

- Optical network measurements
- Creation of test protocols
- Downloading data from the power meter

#### Accessories

• CD with SmartProtocol PC Software

## 2 Preparing the connection

#### (Windows XP)

1. Connect the instrument to a PC using the USB cable and switch the instrument ON. The PC will prompt you to install the new hardware drivers. (first connection)





Fig 2.

2. Use the driver provided by OPTOKON (insert the supplied CD-ROM) and the driver will be installed automatically. This driver will create a virtual serial com port.

Found New Hardware Wizard	
Please wait while the wizard s	searches
USB <-> Serial	Š
	<u>≺B</u> ack <u>N</u> ext > Cancel

Fig 3.

Found New	Hardware Wizard			
Please wa	it while the wizard ins	talls the software		
¢	USB Serial Converter			
	Ď	y	D	
		< <u>B</u> ac	x <u>N</u> ext >	Cancel





Fig 5.



Fig 6.

- 3. It is recommended to verify the driver installation after completing.
- 4. Click on Control panel -> System -> Device manager.



Fig 7.



Fig 8.

🚇 Device Manager	
Eile Action View Help	
<ul> <li>SIMPSON</li> <li>Batteries</li> <li>Computer</li> <li>Disk drives</li> <li>Diplay adapters</li> <li>DVD/CD-ROM drives</li> <li>Floppy disk controllers</li> <li>Floppy disk controllers</li> <li>Floppy disk drives</li> <li>IDE ATA/ATAPI controllers</li> <li>IDE ATA/ATAPI controllers</li> <li>IDE ATA/ATAPI controllers</li> <li>Mice and other pointing devices</li> <li>Modems</li> <li>Monitors</li> <li>Motiors</li> <li>PCMCIA adapters</li> <li>Communications Port (COM1)</li> <li>Printer Port (LPT1)</li> <li>USB Serial Port (COM6)</li> <li>Processors</li> <li>Sound, video and game controllers</li> <li>System devices</li> <li>Universal Serial Bus controllers</li> <li>Standard Universal PCI to USB Host Controller</li> </ul>	
USB Root Hub	
USB Serial Converter	

Fig 9

- 5. Check if the devices marked in red are correctly installed.
- 6. Installation of the USB driver is finished.

Note: In the case of a PC with Windows 7, all necessary installations will be completed automatically.

If the case of a PC with Windows Vista, you have to install drivers manually.

### 3 SmartProtocol

#### 3.1 Starting SmartProtocol – Main screen

- 1. Copy all the content of the SmartProtocol folder from the supplied CD to a PC.
- 2. Start the SmartProtocol "SmartProtocol.exe". The following screen will appear after the software starts up.
- 3. Using the USB cable, connect the instrument in OFF status to the PC.

- SmartProtocol	2.1, (c) copyright (	OPTOKON Co., Ltd. 2	010	 - 6 -	×
File Record Data	a Data Selection	Generate Protocol	Setup Help		
Loss Testing Rep	oort				
Operator:				Date:	7.3.2011
Company:					
Trace:					
Power Meter:					
Route:					

Fig 1.

#### 3.2 Setting the serial port and language

- 1. Turn ON the instrument.
- 2. Click on "Setup" on the main menu.
- 3. Select "Serial Port".(type and serial number of the instrument must be shown)

Serial Port Setting	
Serial Port	COM8 PM800 PM8001003
Data bits:	8
Parity: Stop bits:	None
Flow control:	None
	Cancel OK

Fig 2.

- 4. Check the appropriate parameters of the serial port according to the diagram. The marking of the serial port depends on the PC (see chapter "Preparing connection").
- 5. Select "Language" and set the required language. For other languages please contact the OPTOKON service center.

La	anguage Selection
	english.Ing
	english.ing
	Fig 3.

#### 3.3 Recording data – PM-800, OFT-820, PM-212

There are two methods for recording measured data into SmartProtocol: From the Power Meter or from the TXT file (before the stored data from the Power Meter by using the Hyper Terminal).

- 1. On the main menu, click on "Record Data"
- 2. Select the required option: "From Meter" or "From TXT file".

#### 3.3.1 From Meter

(Note: When recording from the meter, the Power Meter must be correctly connected to the PC and must be ON)

- 1. Click on "Record Data from Meter"
- 2. Immediately in the instrument menu "MORE"->"MEM" and choose "UPLOAD MEMORY" (see instrument's manual)
- 3. The instrument will display "UPLOADING..."
- 4. The SmartProtocol will appear

Data Transfer	
Waiting for Data	
	Cancel
Eig 4	1

гıg 4.

5. Data successfully transferred from the instrument.



Fig 5

6. Data format error (check the connection, the instrument status or serial port installation and repeat all steps in chapter 3.3.1)



Depending on the type of connected Power Meter the serial number of the instrument will be displayed and the main SmartProtocol window will change.

SmartProtocol 2.1, (	(c) copyright (	OPTOKON Co.	, Ltd. 2010					×
File Record Data D	ata Selection	Generate Pr	otocol Set	up He	lp			
Loss Testing Report-								
Operator:	I						Date:	7.3.2011
Company:								
Trace:								
Power Meter:	PM800		PM8001003					
Route:								
End A:					End B:			
					Fiber Length (r	n]:		
No. of Splices:					Splice Loss (d	B]:		
No. of Connectors:					Connector Los	:s [dB]:		
No. of Passive Device	es:				Passive Devic	e Loss (dB):		
Wavelength:		1310 💌	[nm]		Fiber Attenuati	ion (dB/km):		
			<b></b> :.				-	

Fig 5.

In this table the operator can fill in basic data such as: operator name, company name, label for measured trace, route etc.

It is necessary to fill in the number of splices, connectors or passive devices included in a measured optical trace, fiber length and loss limits. From these values the final results for the measured trace (fibers) in the loss test report are calculated.

#### 3.3.2 From TXT file

After selecting "From TXT file", the following screen will appear.

Otevřít		and it is seen to be			X
OptokonTE > SV	/_Sma	rtProtocol >	• 4 <sub>7</sub>	Prohledat: SW_Sm	artProtocol 🔎
Uspořádat 🔻 Nová složka					• 🗌 🔞
Corázky	*	Název položky		Datum změny	Тур
		🍌 CD SmartProtocol 1.1		23.4.2009 14:51	Složka soubori
• D = X0 = X		OPTELIAN CD SmartProtocol 1.1		9.11.2007 13:05	Složka soubori
		ORIGINAL		9.11.2007 10:22	Složka soubori
Acer (C:)		SmartProtocol 2.1		2.3.2011 10:28	Složka soubori
		퉬 SmartProtocol_zip		17.10.2008 10:49	Složka soubori
technici (\\server) (K:)		퉬 Test_preklad		28.4.2008 14:08	Složka soubori
ekonomicke (\\server) (L:)	E	📋 Optokon_Jihlava		19.6.2007 11:36	Textový dokur
obchodni (\\server) (M:)		Optokon_Jihlava_2		19.6.2007 13:30	Textový dokur
logistika (\\server) (N:)		📋 utl.cl.		23.4.2009 14:52	Textový dokur
ISO (\\server) (Q:)					-
support (\\server) (S:)					
🚽 kalibrace (\\server) (T:)					
🕎 vyroba (\\server) (V:)	-	m			+
<u>N</u> ázev souboru	: *.tx		•	Text Files	-
				Otevřít	Storno
<u>.</u>					

Fig 6.

Select and open the appropriate TXT file. The next procedure is the same as for the meter.

#### 3.3.3 Selecting data

- 1. Click on "Data Selection" and select data on the main menu.
- 2. Select "one-sided" or "two-sided" measurement.
- 3. Select the wavelength.
- 4. By using the buttons, transfer the value to the appropriate column (A-B or B-A).
- 5. After completing click on "OK".

Measurement Two side C One side				Wavelength: 1310 nm 💌			
Recorde	d Data			Direction A>B	Direction B>A		
Position	Value			Position Value	Position Value		
1/1	4.32		Add A>B				
1/2	4.43						
1/3	4.59	=	Add B>A				
1/4	4.12						
1/5	4.52						
1/6	4.82						
1/7	4.15		<				
1/8	4.26		,				
1/9	4.38						
1/10	4.68						
1/11	4.11	-					
•	III	Þ	Remove All				

Fig 7.

The recorded data is displayed in the table with the positions corresponding to the positions in the power meter's internal memory.

The power meter's memory has a structured, two-level organization. The results are stored in the CABLE/FIBER memory positions.

The first digit of the position means CABLE folder and the second digit means FIBER (see the power meter manual). It is automatically recognized at which wavelength the measurement was taken. A warning message will be displayed in case the data in the internal power meter's memory contains results with a negative sign (gain). The results stored in "Absolute power measurement mode" (units dBm) will not be transferred into SmartProtocol.

It is important for the operator to consider the memory positions in particular where measured data will be stored before measurement.

For example:CABLE1, FIBER 1-12-CABLE2, FIBER 1-12-12 measurements on 1310 nm, direction A-BCABLE3, FIBER 1-12-12 measurements on 1550 nm, direction A-BCABLE4, FIBER 1-12-12 measurements on 1550 nm, direction B-A12 measurements on 1550 nm, direction B-A

• Measur • Tw	ement o side	C One side		Wavelength:	1310	nm 💌
lecorded	Data		Direction /	A>B	Direction I	3>A
"Osition	Value	Add A>B Add B>A < Remove All	Position 1/1 1/2 1/3 1/4 1/5 1/6 1/7 1/8 1/9 1/10 1/11 1/12	Value 4.32 4.43 4.59 4.12 4.52 4.52 4.82 4.15 4.26 4.38 4.68 4.11 4.37	Position 2/1 2/2 2/3 2/4 2/5 2/6 2/7 2/8 2/9 2/10 2/11 2/12	Value 4.24 4.41 4.47 4.21 4.54 4.81 4.25 4.26 4.35 4.48 4.13 4.24
						OK
a Selecti -Measu ⊙ Tw	ion rement ro side	C One side		Wavelength:	1550	nm 💌
a Selecti - Measu . ⊙ Tw Recordec	ion rement ro side 1 Data	C One side	Direction /	Wavelength: A>B	1550 Direction E	nm 💌

Fig 8.

#### 3.4 Recording data – PM-830

The procedure is similar as in the previous chapter.

- 1. On the main menu, click on "Record Data"
- 2. Select the required option: "From Meter" or "From TXT file".
- 3. Depending on the type of power meter connected the serial number of the instrument will be displayed and the main SmartProtocol window will change.

-	SmartProtocol 2.	1, (c) copyright O	PTOKON Co., Ltd. 20	010	-	-	-			x
F	ile Record Data	Data Selection	Generate Protocol	Setup	Help					
[	Loss Testing Repo	rt								
	Operator:	I						Date:	7.3.2011	
	Company:									
	Trace:									
	Power Meter:	PM830	PM8300	0006						
	Route:									

Fig 9

#### 3.4.1 Selecting data

Vse/Nic	č.	OLT	ONT	LOC	1310nm	Status	1490nm	Status	1550nm	Status	Jednotky	Sada limitů	Přejmenovat lokac
	1.	1	1	1	3.00	PASS	-5.00	PASS	8.30	PASS	dBm	7	
	2.	1	1	1	2.80	PASS	-5.30	PASS	8.20	FAIL	dBm	7	Editovat limity
	3.	1	1	1	2.90	PASS	-5.20	PASS	-9.60	WARNING	dBm	7	
													Vyhodnocovat
													✓ 1310nm
													✓ 1490nm
													▼ 1550pm
													Cancel

1. Click on "Data Selection" and select data from the main menu.

Fig. 10

- 2. Select the measurements to be used in the final test report.
- 3. If necessary, rename locations, select the appropriate wavelength or edit thresholds.
- 4. After completing, click on "OK".

Edit Threshold	ds			x			
GPON S IN(	(8) EPON ON	IT(9) EPON OL	T(10) EAA(1	1) • •			
Name		EPON ONT					
F	PASS	WARNING	FAIL				
1310nm	5.5	2.0	1.0	[dBm]			
1490nm	-4.0	-22.0	-25.0	[dBm]			
1550nm	6.9	-10.6	-13.6	[dBm]			
Load fi	rom Meter		Save to Me	ter			
Load from File Save to File							
	ancel		ОК				
		Fig. 11					

## 3.5 Creating a loss test report

- 1. Click on "Generate Protocol" in the main menu.
- 2. HTML Protocol will be created.

The final measurement protocol depends on the type of test method and measurement device used. There are different measuring protocols for the PM-830 and other measuring instruments.



Date: 8.3.2011 Operator: Magda Rychnovská Company: OPTOKON Co., Ltd OPTOKON Co., Ltd. E-mail: <u>OPTOKON@OPTOKON.CZ</u> WWW: <u>http://WWW.OPTOKON.CZ</u>

Loss Testing Report

Trace:	OPTOKON Cable Hous	e - Znojmo	
Route:	OPTOKON Cable Hous	e - Jihlava	
End A:	Cable House	End B:	Jihlava
Power Meter:	PM420 PM4207090	Fiber Length:	8000 m
No. of Splices:	10	Splice Loss:	0.1 dB
No. of Connectors:	2	Connector Loss:	0.5 dB
No. of Passive Devices:	0	Passive Device:	3.6 dB
Fiber Attenuation 1310 nm:	0.35 dB/km	Loss Limit 1310 nm:	4.80 dB
Fiber Attenuation 1550 nm:	0.20 dB/km	Loss Limit 1550 nm:	3.60 dB

Table of Measured Values

Fibor	Loss [dB] 1310 nm			Los	Niete		
Fibel	A-B	B-A	Avg.	A-B	B-A	Avg.	Note
1.	4.32	4.24	4.28	3.48	3.42	3.45	PASS
2.	4.43	4.41	4.42	3.56	3.51	3.54	PASS
3.	4.59	4.47	4.53	3.26	3.22	3.24	PASS
4.	4.12	4.21	4.17	3.28	3.18	3.23	PASS
5.	4.52	4.54	4.53	3.33	3.31	3.32	PASS
6.	4.82	4.81	4.81	3.68	3.72	3.70	FAIL
7.	4.15	4.25	4.20	3.24	3.26	3.25	PASS
8.	4.26	4.26	4.26	3.41	3.41	3.41	PASS
9.	4.38	4.35	4.37	3.27	3.27	3.27	PASS
10.	4.68	4.48	4.58	3.75	3.51	3.63	FAIL
11.	4.11	4.13	4.12	3.27	3.18	3.23	PASS
12.	4.37	4.24	4.30	3.59	3.48	3.54	PASS
Avg.	4.40	4.37	4.38	3.43	3.37	3.40	
Max.	4.82	4.81	4.81	3.75	3.72	3.70	
Min.	4.11	4.13	4.12	3.24	3.18	3.23	



Date: 8.3.2011 Operator: Jiří Tragan Organization: OPTOKON Co., Ltd OPTOKON Co., Ltd. E-mail: <u>OPTOKON@OPTOKON.COM</u> WWW: <u>http://WWW.OPTOKON.COM</u>

Test Results

Trace:

GPON

Route:

OPTOKON

Power Meter:

PM830 PM8300006

Table of measured values

	OLT ID:1 <-> ONT I	D:1	WARNING		
Location	Wavelength [nm]	Power [dBm]	Status	Thresholds	
	1310	3.00	PASS		
1	1490	-5.00	PASS	GPON S OUT(7)	
	1550	8.30	PASS		
	1310	2.80	PASS		
1	1490	-5.30	PASS	GPON S OUT(7)	
	1550	8.20	PASS		
	1310	2.90	PASS		
1	1490	-5.20	PASS	GPON S OUT(7)	
	1550	-9.60	WARNING		
Note:					

	Apli	ed Thresholds		
Threshold Set	Wavelength [nm]	PASS [dBm]	WARNING [dBm]	FAIL [dBm]
	1310	3.0	-1.5	-2.5
GPON S OUT(7)	1490	-2.5	-21.0	-24.0
	1550	8.4	-9.6	-12.6

#### Fig 13.

3. The created HTML protocol can be printed, converted to a PDF file or saved.

#### 3.6 Protocol management

Click on "File" on the main menu. There are the following options:

- Create a new Protocol
- Open the saved Protocol
- Save the pre-configured SmartProtocol for future use
- Export the recorded data into the TXT file using SmartProtocol

Kecord Data Data Sele	ction Generate Protocol Setu	ip Help	
New Protocol			
Open Protocol	á	Date	8.3.2011
Save Protocol		41	
Save Protocol as	louse - Znoimo		
Data Export into TXT File			
<b>5.</b>	PM4207090		
oute: IUPTUKI	UN Cable House - Jihlava		
nd A: Cable H	ouse	End B: Jihlava	
		Fiber Length [m]:	8000
o. of Splices:	10	Splice Loss [dB]:	0.1
o. of Connectors:	2	Connector Loss [dB]:	0.5
	0	Passive Device Loss (dB):	3.6
o. of Passive Devices:			

Fig 14.

## 4 Calibration, OPTOKON service center

OPTOKON, a.s., Červený Kříž 250 586 01 Jihlava Czech Republic tel.: +420 564 040 111 fax: +420 564 040 134 OPTOKON@OPTOKON.CZ WWW.OPTOKON.COM

