



Russian designer and manufacturer of communication equipment



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- 28 years of experience in designing and manufacturing telecommunication equipment
- More than 750 employees
- 14 software development laboratories
- 2 industrial complexes in Novosibirsk (Russia) and Almaty (Kazakhstan)
- More than 100 partner companies in Russia,
 CIS, Europe, Asia and the Middle East
- More than 1500 client companies



Development

- Hardware
- Software



Manufacture

- Surface-mount technology
- Through-hole technology
- Assembling
- Software installation
- Testing of serial production equipment



Maintenance

- Technical support
- Service center
- Software updating
- Repair



- 12M PON OLT ports
- 4,5M Ethernet ports
- 6M VolP ports
- 2M IPTV set-top boxes
- 1,2M TDM ports





















Name	Under development		Indoor				
TVAITE	WEP-32ax	WEP-3ax	WEP-12ac	WEP-2ac	WEP-2ac Smart	WEP-2L	WEP-1L
Device image	$ \mathcal{L}_b $	A		serrex.	-1 o(7e _X)	**************************************	-1
Wi-Fi chip	Broadcom 43694	Broadcom BCM47622, BCM43570	Broadcom BCM43460	Broadcom BC	M47452, BCM43217	Realtek RTL81	97FS, RTL8812FR
Roaming		Seamless roaming (802.11k/v/r)					
Bandwidth				ultaneous operation a		000 44 (\Ar' 5' 4)	000.44 (14/1.51.4)
Wi-Fi standard	802.11ax (Wi-Fi 6/Wi-Fi 6E)	802.11ax (Wi-Fi 6/Wi-Fi 6E)	802.11n (Wi-Fi 4) 802.11ac (Wi-Fi 5)	802.11n (Wi-Fi 4) 802.11ac (Wi-Fi 5)	802.11n (Wi-Fi 4) 802.11ac (Wi-Fi 5)	802.11n (Wi-Fi 4) 802.11ac (Wi-Fi 5)	802.11n (Wi-Fi 4) 802.11ac (Wi-Fi 5)
MIMO technology	4x4:4	2x2:2	3x3:3	2x2:2	2x2:2	2x2:2	2x2:2
Type and number of antennas	Built-in 4 pcs 2.4 GHz 4 pcs 5 GHz	Built-in 2 pcs 2.4 GHz and 5 GHz 2 pcs 5 GHz	Built-in 3 pcs - 2.4GHz 3 pcs - 5 GHz	Built-in 2 pcs 2.4 GHz 2 pcs 5 GHz	Built-in Omni Antenna - 2.4 GHz Built-in Smart Antenna - 5 GHz	Built-in 2 pcs - 2.4GHz and 5 GHz	Built-in 2 pcs - 2.4GHz and 5 GHz
Third radio interface		802.11ac (Wi-Fi 5)					
Operation modes	Managed by controller Standalone		 Managed by controller In cluster (controller is one of the points) Standalone 		Managed by controller Standalone		
WIDS/WIPS	Under development	Under development	•	•	•		
Airtune	Under development	Under development	•	•	•		
Mesh	Under development	Under development	•	•	•		
ОТТ	Under development	Under development	•	•	•	Under development	Under developme
802.11u support (Wi-Fi offload)	Under development	Under development	•	•	•		
Coverage area				150 m			
		Outdoor					
Nam	1e <u> </u>	WOP-1	Zac	w	OP-2ac	wo	DP-2L
Device image		Property			10		
Device image Wi-Fi chip		Broadcom B	3CM43460	BCM47	3roadcom 452, BCM43217		iealtek FS, RTL8812FR
		Broadcom E	3CM43460	BCM47	Broadcom 452, BCM43217 paming (802.11k/v/r)		
Wi-Fi chip		Broadcom E	3CM43460	BCM47 Seamless ro	452, BCM43217	RTL8197	
Wi-Fi chip Roaming		Broadcom E 802.11n (Wi-Fi 4) 8		Seamless ro Simultaneous op	452, BCM43217 paming (802.11k/v/r)	RTL8197	
Wi-Fi chip Roaming Bandwidth			802.11ac (Wi-Fi 5)	Seamless ro Simultaneous op	452, BCM43217 paming (802.11k/v/r) peration at 2.4 and 5 GHz	RTL8197 802.11n (Wi-Fi	FS, RTL8812FR
Wi-Fi chip Roaming Bandwidth Wi-Fi standard	of antennas	802.11n (Wi-Fi 4) 8	802.11ac (Wi-Fi 5) :3 4 GHz	BCM47 Seamless rc Simultaneous op 802.11n (Wi-I	eration at 2.4 and 5 GHz	RTL8197 802.11n (Wi-Fi 4 External	FS, RTL8812FR 4) 802.11ac (Wi-Fi 5) 2x2:2
Wi-Fi chip Roaming Bandwidth Wi-Fi standard MIMO technology	of antennas	802.11n (Wi-Fi 4) 8 3x3 External: 3 pcs 2.	802.11ac (Wi-Fi 5) :3 4 GHz	BCM47 Seamless rc Simultaneous op 802.11n (Wi-l	452, BCM43217 paming (802.11k/v/r) peration at 2.4 and 5 GHz Fi 4) 802.11ac (Wi-Fi 5) 2x2:2 ternal: bcs 2.4 GHz	802.11n (Wi-Fi 4 External 2 pcs 2	FS, RTL8812FR 4) 802.11ac (Wi-Fi 5) 2x2:2 2x4 and 5 GHz
Wi-Fi chip Roaming Bandwidth Wi-Fi standard MIMO technology Type and number of	of antennas	802.11n (Wi-Fi 4) 8 3x3 External: 3 pcs 2.	802.11ac (Wi-Fi 5) :3 4 GHz GHz • Managed by contributed to the contributed of points of the contributed of	BCM47 Seamless rc Simultaneous op 802.11n (Wi-l	452, BCM43217 paming (802.11k/v/r) peration at 2.4 and 5 GHz Fi 4) 802.11ac (Wi-Fi 5) 2x2:2 ternal: bcs 2.4 GHz	802.11n (Wi-Fi 4 External 2 pcs 2	FS, RTL8812FR 1) 802.11ac (Wi-Fi 5) 2x2:2 1.4 and 5 GHz
Wi-Fi chip Roaming Bandwidth Wi-Fi standard MIMO technology Type and number of	of antennas	802.11n (Wi-Fi 4) 8 3x3 External: 3 pcs 2.	802.11ac (Wi-Fi 5) :3 4 GHz GHz • Managed by contributed to the contributed of points of the contributed of	BCM47 Seamless rc Simultaneous op 802.11n (Wi-l	2452, BCM43217 Deaming (802.11k/v/r) Deration at 2.4 and 5 GHz Fi 4) 802.11ac (Wi-Fi 5) 2x2:2 Deternal: Decs 2.4 GHz Decs 5 GHz	802.11n (Wi-Fi 4 External 2 pcs 2	FS, RTL8812FR 4) 802.11ac (Wi-Fi 5) 2x2:2 : :.4 and 5 GHz
Wi-Fi chip Roaming Bandwidth Wi-Fi standard MIMO technology Type and number of Operation modes WIDS/WIPS	of antennas	802.11n (Wi-Fi 4) 8 3x3 External: 3 pcs 2. 3 pcs 5 o	802.11ac (Wi-Fi 5) :3 4 GHz GHz • Managed by contributed to the contributed of points of the contributed of	BCM47 Seamless rc Simultaneous op 802.11n (Wi-l	452, BCM43217 paming (802.11k/v/r) peration at 2.4 and 5 GHz Fi 4) 802.11ac (Wi-Fi 5) 2x2:2 ternal: pcs 2.4 GHz pcs 5 GHz	802.11n (Wi-Fi 4 External 2 pcs 2	FS, RTL8812FR 4) 802.11ac (Wi-Fi 5) 2x2:2 : :.4 and 5 GHz
Wi-Fi chip Roaming Bandwidth Wi-Fi standard MIMO technology Type and number of Operation modes WIDS/WIPS Airtune	of antennas	802.11n (Wi-Fi 4) 8 3x3 External: 3 pcs 2. 3 pcs 5 o	802.11ac (Wi-Fi 5) :3 4 GHz GHz • Managed by contributed to the contributed of points of the contributed of	BCM47 Seamless rc Simultaneous op 802.11n (Wi-l	452, BCM43217 paming (802.11k/v/r) peration at 2.4 and 5 GHz Fi 4) 802.11ac (Wi-Fi 5) 2x2:2 ternal: pcs 2.4 GHz pcs 5 GHz	802.11n (Wi-Fi 4 External 2 pcs 2 • Manage • Standal	FS, RTL8812FR 4) 802.11ac (Wi-Fi 5) 2x2:2 : :.4 and 5 GHz
Wi-Fi chip Roaming Bandwidth Wi-Fi standard MIMO technology Type and number of Operation modes WIDS/WIPS Airtune Mesh		802.11n (Wi-Fi 4) 8 3x3 External: 3 pcs 2. 3 pcs 5	802.11ac (Wi-Fi 5) :3 4 GHz GHz • Managed by contributed to the contributed of points of the contributed of	BCM47 Seamless rc Simultaneous op 802.11n (Wi-l	452, BCM43217 paming (802.11k/v/r) peration at 2.4 and 5 GHz Fi 4) 802.11ac (Wi-Fi 5) 2x2:2 ternal: poss 2.4 GHz poss 5 GHz	802.11n (Wi-Fi 4 External 2 pcs 2 • Manage • Standal	4) 802.11ac (Wi-Fi 5) 2x2:2 E.4 and 5 GHz ed by controller one
Wi-Fi chip Roaming Bandwidth Wi-Fi standard MIMO technology Type and number of Operation modes WIDS/WIPS Airtune Mesh OTT		802.11n (Wi-Fi 4) 8 3x3 External: 3 pcs 2. 3 pcs 5 i	802.11ac (Wi-Fi 5) :3 4 GHz GHz • Managed by contributed to the contributed of points of the contributed of	BCM47 Seamless rc Simultaneous op 802.11n (Wi-l	452, BCM43217 paming (802.11k/v/r) peration at 2.4 and 5 GHz Fi 4) 802.11ac (Wi-Fi 5) 2x2:2 ternal: poss 2.4 GHz poss 5 GHz	802.11n (Wi-Fi 4 External 2 pcs 2 • Manage • Standal	4) 802.11ac (Wi-Fi 5) 2x2:2 E.4 and 5 GHz ed by controller one



WIRELESS BROADBAND ACCESS FOR SMALL COMMUNITIES

	Base sta	ntions	User stations		
Name	WOP-2ac-LR5	WOP-2ac-LR2	WB-2P-LR5	WB-2P-LR2	
Device image					
Wi-Fi chip	Realtek RTL8197FS, RTL8812BRH	Realtek RTL8197FS	Realtek RTL8197FS, RTL8812BRH	Realtek RTL8197FS	
Wi-Fi standard	802.11ac (Wi-Fi 5)	802.11n (Wi-Fi 4)	802.11ac (Wi-Fi 5)	802.11n (Wi-Fi 4)	
Frequency range	5 180 - 6 150 MHz	2402 —2482 MHZ	5 180 - 6 150 MHz	2402 —2482 MHZ	
MIMO technology	2x2:2	2x2:2	2x2:2	2x2:2	
Channel width	5, 10, 20, 40, 80	5, 10, 20, 40, 80	5, 10, 20, 40, 80	5, 10, 20, 40, 80	
Centralized management	EMS management system	EMS management system	TR-069	TR-069	
Polling support	•	•	•	•	
Intersectoral synchronization	Under development	Under development			
Type and number of antennas, pcs	External: 2 pcs — 5-6 GHz	External: 2 pcs — 5-6 GHz	Built-in: 1 pcs — 5-6 GHz	Built-in: 1 pcs — 5-6 GHz	
Transmitter power, dBm	28	26	28	26	

2G/3G/4G terminal

zu/ su/ 4u terminat				
Name	WB-15-W	WB-15-W2		
Device image				
LTE support	2G/3G/4G LTE	2G/3G/4G LTE		
Modem	Neoway N720	Neoway N720		
Frequency range	4G LTE FDD: B1, B3, B5, B7, B8, B20 4G LTE TDD: B40 3G UMTS: B1, B8 2G GSM/GPRS/EDGE: 850/900/1800/1900 MHz	4G LTE FDD: B1, B3, B5, B7, B8, B20 4G LTE TDD: B40 3G UMTS: B1, B8 2G GSM/GPRS/EDGE: 850/900/1800/1900 MHz		
Interfaces	1 Ethernet 10/100 Base-T	1 Ethernet 10/100 Base-T		
Number of SIM cards, pcs	2 (redundancy)	2 (redundancy)		
Type and number of antennas	External: 2 pcs LTE Built-in: 2 pcs 2.4 GHz	External: 2 pcs LTE Built-in: 2 pcs 2.4 GHz		
Number of radio interfaces	1	2		
Wi-Fi chip	Realtek RTL8197FS	Realtek RTL8197FS, RTL8192FR		
Wi-Fi	802.11n (Wi-Fi 4)	802.11n (Wi-Fi 4)		
Sniffer/Radar		•		
GPS	•	•		
Power supply	Passive POE (24V), DC 9-36V			
Management	Under development			