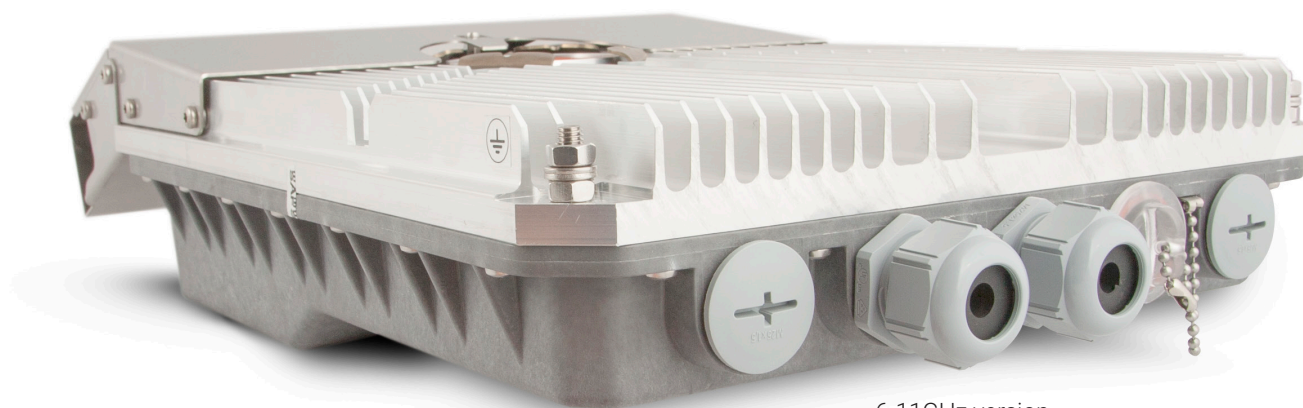# Integra-GS

**carrier-grade microwave radio,
delivering up to 1Gbps Full Duplex**

- SAF Tehnika most powerful modem yet with 3.5MHz to 60MHz channel bandwidth and up to 2048QAM modulation support for universal network upgrades in a compact, single hardware design.

- Full outdoor unit includes radio, modem, Ethernet network processor, and PoE splitter with surge arrestor.

- SFP ports for easy installation – choose single-mode or multi-mode fibre by changing SFP's, add fibre optic cabling later.

- Advanced Ethernet network processor features AES encryption, efficient header compression, advanced Quality of Service, and MEF compliant functionality.

- Built-in protected 2+0 layer 1 link bonding provides double capacity up to 982 Mbps and up to 1Gbps with header compression.

6-11GHz version

Integra-GS is an unbelievably light, energy efficient carrier-grade system that exemplifies an outstanding return on smart engineering - the synergy of high competence in radio electronics and materials science. Slip-fit design allows integration with existing high performance antenna systems or integration with 2+0 aggregation setups for up to 982Mbps Full Duplex capacity without header compression. Gigabit Power over Ethernet (PoE) port defines simple installation, while dual SFP slots enable fibre optic installation – giving the user ultimate flexibility in cable design.

Capacity	up to **1Gbps** with Header compression
Frequency bands	6GHz, 7GHz, 8GHz, 11GHz, 13GHz, 15GHz, 17GHz UL, 18GHz, 23GHz, 24GHz UL, 25GHz, 26GHz, 28GHz, 38GHz, and more*
Modulation	4QAM / 16QAM / 32QAM / 64QAM / 128QAM / 256QAM / 512QAM / 1024QAM / 2048QAM with Hitless ACM
Configurations	1+0, 2+0 link bonding, 1+1*
Channel bandwidth	
ETSI	from 3.5MHz up to 56MHz, up to 472 Mbps
FCC	from 5MHz up to 60MHz, up to 491 Mbps
Gigabit Ethernet	
1x RJ-45	Electrical with built-in PoE splitter and surge arrestor
2x SFP	Fibre Optics
Service ports	
3.5mm	Audible alignment and RSSI
USB B-Type	Terminal Access
LED	Power On, Link Synchronization, RSL, Polarization accuracy
Managed Gigabit Switch functionality	802.1Q VLANs with QoS/CoS incl. WRED*, shaping, DWRR and on MPLS-TP exp bit; Spanning Tree Protocol, Jumbo frames and more*
Management	In-band MNG over same ETH port; SNMP v1/2c/3, SSH, Telnet, HTTPS, Serial, RADIUS, Network Time Protocol
Carrier Ethernet functionality	Provider Bridging, MEF9&14, High Efficiency Header Compression, OAM*
Performance monitoring	Performance graphs, constellation diagram, alarms, detailed counters
Antenna type	External, Slip-fit
Form factor	235 x 250 x 72 mm / 9.26" x 9.85" x 2.84", 2.9 kg / 6.4 lbs (15-42GHz) 280 x 437 x 100 mm / 11.02" x 17.2" x 3.9", 6.5 kg / 14.3 lbs (6-11GHz)
Temperature range	-33 ... +55 °C / -28 ... +130 °F

* Please contact SAF Tehnika representative for more information

For more detailed information about SAF products visit **www.saftehnika.com** or contact your SAF representative **info@saftehnika.com**
Product features may vary between different models and configurations. They are subject to change without prior notice.
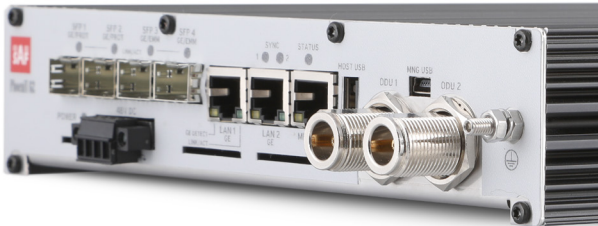
SAF Tehnika © 2017

PhoeniX G2

MISSION-CRITICAL | HIGH CAPACITY BACKHAUL

- Flexible modular wireless system transporting IP with native ASI and TDM data over 2 GHz - 38 GHz radios.

- High spectral efficiency delivering more than 900 Mbps per 2+0 system.

- Flexible configurations including all-indoor or split-mount architecture from 1+0 to 2+0 XPIC up to 8+0 delivering 4+ Gbps over a single path.

- Fully redundant system configurations for protecting every component.

- Very High Power radios for long distance back-haul.

- Ideal microwave system for critical network infrastructure with secure HTTPS/SSH access, FIPS 197 256-bit AES over the air encryption at 99.9999% availability.

Supporting channel bandwidths of up to 60 MHz, the PhoeniX G2 enables transition from TDM only or ASI only networks to hybrid native ASI/T1/E1/IP networks, providing up to 16 ASI ports for video or up to 64E1/T1 lines for telephony, and Gigabit Ethernet ports for IP connectivity with total throughput of up to 900 Mbps in 2+0 configuration.

**PhoeniX G2
IDU modem**

	ETSI	FCC
Frequency Bands	2GHz*, 4GHz, U4GHz, L6GHz, U6GHz 7GHz, 8GHz, 11GHz, 13GHz, 18GHz, 23GHz, 38GHz	
Channel Bandwidths	from 7 MHz, up to 56 MHz	from 10 MHz, up to 60 MHz
Modulation	up to 1024 QAM	
Capacity	up to 900 Mbps in 2+0	
Configurations	1+0, 1+1 HSB/SD/FD, 1+0 Dual (Repeater), 2+0 (Layer 1 aggregation), 2+0 XPIC, 2+2** (with two IDUs)	
Synchronization	PTP 1588v2, SyncE	
Encryption	AES 256-bit	
Traffic/Management ports	3x 10/1000Base-T, RJ-45 – for traffic and/or management access, 4x SFP (1000BseSX/LX) – for traffic, also work as Extension/Protection ports/Aggregation ports, USB B – alternative serial IP management access, USB A - flash memory port, 2x N-Type Female – for connection to RF's	
Management	MIB, SNMP v1/v2c /v3, Web GUI (HTTP/HTTPS), CLI (Telnet/SSH), Serial interface (USB IP port) , in-band or out-band management	
Ethernet switch	Managed Gigabit Ethernet Layer 2	
QoS	64 level DiffServ (DSCP) or 8 level 802.1p mapped in 4 prioritization queues with VLAN support, IPv6 Traffic Class	
VLAN support	802.1Q, up to 4096 VLANs	
IDU Operational use	ETSI EN 300 019, Part 1-3, Class 3.2	
Max. power consumption	IDU only: <30W IDU+2xODU: <180W	

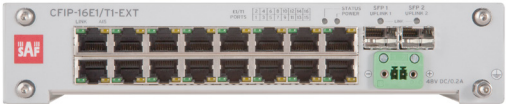* Please contact a SAF Tehnika representative for more information

Maximum Tx Power [dBm] for PhoeniX G2*

Modulation	2 GHz (VHP)**	4/U4 GHz (HP)	L6/U6 GHz (SP/HP/VHP)	7 GHz (SP/HP/VHP)	8 GHz (SP/HP/VHP)	11 GHz (SP/HP/VHP)	13 GHz (SP/HP/VHP)	18 GHz (SP/VHP)	23 GHz (SP)	38 GHz (SP)
4 QAM	+35	+33	+19/+27/+33	+19/+27/+32	+19/+27/+31	+19/+25/+29	+19/+25/+28	+19/+26	+19	+17
16 QAM	+34	+32	+18/+26/+32	+18/+26/+31	+18/+26/+30	+18/+24/+28	+18/+24/+27	+18/+25	+18	+16
32 QAM	+33	+31	+17/+25/+31	+17/+25/+30	+17/+25/+29	+17/+23/+27	+17/+23/+26	+17/+24	+17	+15
64 QAM	+32	+30	+16/+24/+30	+16/+24/+29	+16/+24/+28	+16/+22/+26	+16/+22/+25	+16/+23	+16	+14
128 QAM	+32	+30	+16/+24/+30	+16/+24/+29	+16/+24/+28	+16/+22/+26	+16/+22/+25	+16/+23	+16	+14
256 QAM	+31	+29	+15/+23/+29	+15/+23/+28	+15/+23/+27	+15/+21/+25	+15/+21/+24	+15/+22	+15	+13
512 QAM	+30	+28	+14/+22/+28	+14/+22/+27	+14/+22/+26	+14/+20/+24	+14/+20/+23	+14/+21	+14	+12
1024 QAM	+27	+25	+11/+19/+25	+11/+19/+24	+11/+19/+23	+11/+17/+21	+11/+17/+20	+11/+18	+11	+9

* Preliminary data
** 2 GHz ODU is currently in development

	CFIP-ASI-EXT EAGMEXA4	CFIP-16E1/T1-EXT EAGMEX16
ASI	Unbalanced, 75 ohm	
16xE1/T1	-	G.703-E1 balanced 120ohm for E1 mode G.703-E1 unbalanced 75 ohm for E1 mode T1.102-T1/100 ohm for T1 mode
Scalability	Cascading up to four external modules	
Ports		
IDU connection	1x SFP port 1000Base-SX (proprietary GigE protocol) Connection to	
Connection to next External module	1x SFP port 1000Base-SX (proprietary GigE protocol)	
ASI ports	4x BNC	-
E1 ports	-	16x RJ-45
DC port	Industrial power connector	
Mechanical & Electrical		
Dimensions: HxWxD	½ width 1U (45 x 210 x 240 mm) / (1.77 x 8.27 x 9.45 in)	
Weight	1.3 kg / 2.87 lb	
Max. power consumption	IDU: <9 W	
DC port	-20V to -60V DC	

SP/HP ODU

VHP ODU

IRFU

	SP ODU	HP ODU	VHP ODU	IRFU
Ports				
Antenna	N-type or flange	N-type or flange	N-type or flange	A) N-Type or flange B) SMA Tx and Rx ports
IF to IDU	N-type	N-type	N-type	SMA
RSSI	BNC	BNC	BNC	2-port for multi-meter
Power	over IF port	over IF port	over IF port	2-pin power port (alternative to IF port)
Mechanical & Electrical				
Operational use	Conforms to ETSI EN 300 019 Class 4.1, IP65, NEMA 4X			Conforms to ETSI EN 300 019 Class 3.1E, IP20, NEMA 1
Temperature Range	-33°C to +55°C	-33°C to +55°C	-33°C to +55°C	-5°C to +55°C
Dimensions HxWxD/width	288x288x80mm / 3.5kg	288x288x80mm / 3.5kg	280x437x110mm / 7.5kg	19" 2U rack 90x430x260 / 5.8kg
IF port surge protection	Conforms to ETSI EN 301 489-1; EN 61000-4-5; IEC 61000-4-5			
Input DC voltage	-40.5V to -57V DC (conforms to ETSI EN 300 132-2)			
Max. power consumption	13-27W	21-39W	39-55W	SP: 13-27W; HP: 21-39W; VHP: 39-55W

SAF NMS

SAF NMS provides the following functionality:

- Real-time monitoring and management of SAF network elements (predefined polling profiles, alarm threshold values)
- Event and fault notifications (including SMS and e-mail)
- Easy-to-use GUI (including Android app)
- Secure access (including SNMPv3 support)
- Northbound interface, backup server support
- FCAPS compliance
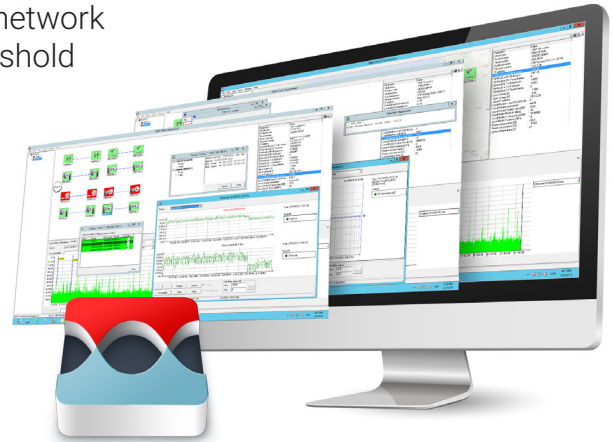
PhoeniX G2 in your network