CFIP PhoeniX Series

TDM/IP Split Mount System

Technical Description & Configuration Guide

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To get up to date information about accessories and their availability, please contact sales representative.

FODU does not contain serviceable parts. Warranty will not be applicable in the event FODU has been hermetically unsealed.

SAF Tehnika, JSC is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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1 Overview

This document briefly describes the **CFIP PhoeniX** series **TDM/IP split mount system** (IDU+ODU) covering the built-in management system, configuration functionality, hardware features, etc.

1.1 CFIP PhoeniX TDM/IP split mount system

CFIP product family is the new next generation product line which is targeting growing demands for data transmission over microwave radio.

As a result the primary traffic interface for CFIP split mount system is Gigabit Ethernet. As CFIP is capable of providing bit rate of **up to 363Mbps**, it is a great addition to SAF portfolio. CFIP radio and modem performance allows achieving high system capacity by employing 256-decision states modulation scheme by user's choice. Apart from the **full system capacity of 363Mbps**, it is possible to configure the radio to any of 3.5, 7, 14, 28, 40 and 56 MHz channels as well as to any of **4QAM, 16QAM, 32QAM, 64QAM, 128QAM and 256QAM modulations**, thus providing various capacities to suit particular needs.

SAF Tehnika has employed most modern design solutions and components to create high performance split mount system with **low power consumption** – 33-69W per system.

CFIP is a perfect building block for any modern future proof wireless network, including mobile service providers, fixed data service operators, enterprise customers, municipal and governmental networks among others.

1.2 CFIP PhoeniX feature Summary

1.2.1 Main Features

- Split mount system solution
- Capacity: up to **363 Mbps**
- Channel Bandwidth: **3.5 / 7 / 14 / 28 / 40 / 56 MHz**
- Modulations: **4QAM / 16QAM / 32QAM / 64QAM / 128QAM / 256QAM**

1.2.2 ODU mechanical features

- Compact unit, **285x285x80mm**, **3.9kg**, antenna adaption backwards compatible with all **CFM** and **CFQ** series units
- **3 handles** for user convenience
- Safe and easy to use **4 side locking** arrangement
- All connectors on the side of the unit, always at **45°** regarding vertical axis for both V and H polarization

Figure 1.1 *CFIP PhoeniX ODU*

1.3 Application Examples

1.3.1 CFIP PhoeniX 1+0 configuration

- Basic split-mount 1+0 system with up to 20E1/T1 or up to 363 Mbps Ethernet

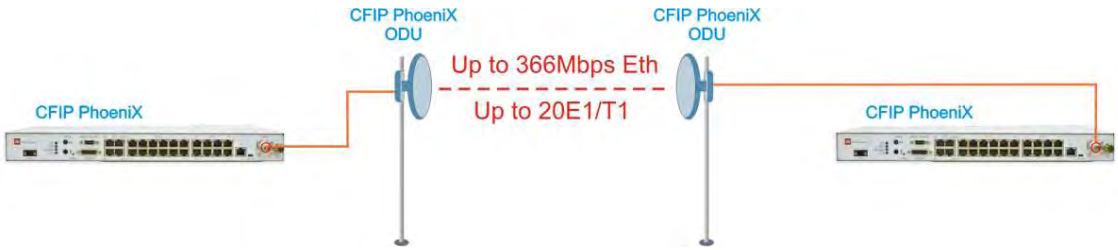

Figure 1.2 *CFIP PhoeniX 1+0 configuration*

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1.4 Technical specification

	CFIP PhoeniX ODU
General	
Band	5.8 GHz
Form factor	IDU – ODU split-mount
Antenna	External
Tx-Rx architecture	FDD
RF	
Frequency range	5725 – 5850 MHz
Max Tx power	+ 30 dBm
Max channel bandwidth	30 MHz
Supported modulations	QPSK/4QAM, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Duplex offset	95MHz
Ports	
Antenna	N-Type
IF to IDU	N-Type
RSSI	BNC
Mechanical & Electrical	
Operational use	Conforms to ETSI EN 300 019 Class 4.1, IP65, NEMA 4X
Temperature Range	-27°F to +131°F
Dimensions: HxWxD / weight	11.3x11.3x3.1 in / 7.7 lb
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	SP: 13-27 W; HP: 21-39 W

1.5 Cable Requirements

IDU-ODU cable

IDU-ODU cable is a 50 Ω coaxial cable intended to interconnect the Indoor Unit with the Outdoor Unit. Any type of 50 Ω cable of good quality can be used; the cable should be equipped with N–type male connectors on each end. There are two N–type male connectors included in each radio unit delivery that fit RG–213 cables or other cables with a surface diameter of 10 mm. As the attenuation of the cable is essential particularly at 350 MHz frequency, its usage is restricted, - the attenuation of the signal should not exceed 20 dB at 350 MHz. Commonly employing RG–213 type coaxial cable, its length may reach 100 m, LMR–400 type cable may usually reach up to 300 m in length.

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Figure 1.3 *CFIP PhoeniX IDU-ODU cable*

RSSI BNC

To connect the digital multimeter to the CFIP PhoeniX ODU RSSI port in order to adjust the antenna alignment, a coaxial cable with BNC connector on one end and appropriate termination on other end can be used (see example in ***Figure 1.4***).

Figure 1.4 *Cable for connecting the voltmeter to the CFIP PhoeniX ODU RSSI port*

1.6 Labelling

The label contains the following information (see samples in the picture below):

- Model name. The model name example is:

  CFIP-06-PhoeniX for 5.8GHz Outdoor Unit (ODU), etc
- Product Number (S06RPR18L): product number contains information of product version (18), in case of ODU - in which frequency band (06) and band side (L, H) the ODU operates. Letters A, B, C or D indicate specific subband (if applied).
- Unit Serial Number (389740100382); the serial number uniquely identifies the unit.

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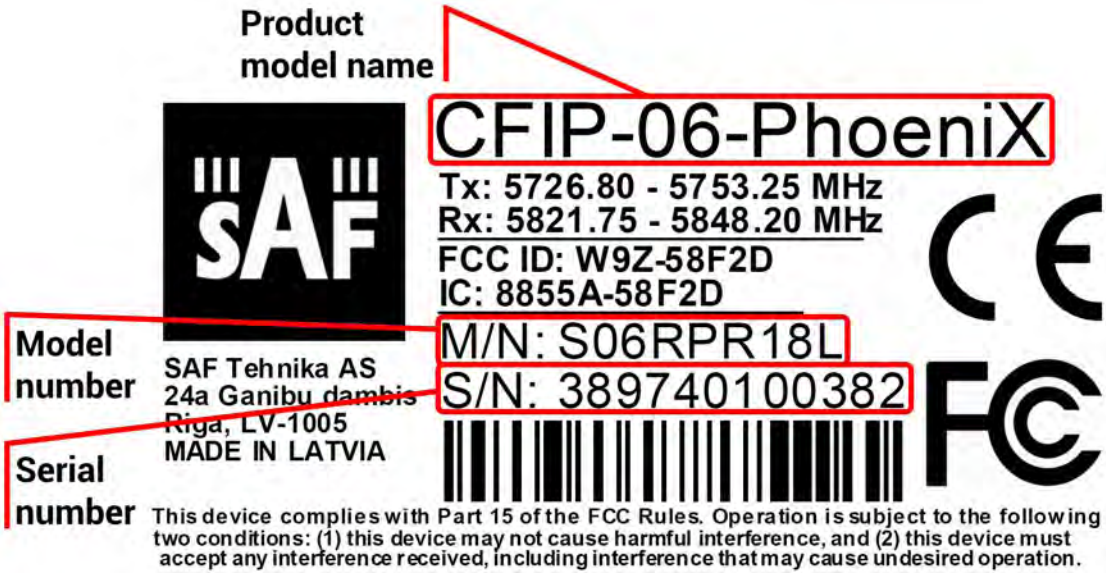

Figure 1.5 *Label of the CFIP PhoeniX ODU Low band side, operating in 5.8 GHz band*

P/N Translation for CFIP PhoeniX ODU:

- "S" designates CFIP split mount series product;
- "06" designates Frequency range (5.8 GHz) of the Unit;
- "RP" designates high power radio;
- "R" designates ODU operating 10 - 40MHz;
- "18" designates the version number of the Unit;
- "L" designates the band side in which ODU operates (H, L).

Please note that frequency range is set from the central frequency of the first 14 MHz channel to the central frequency of the last 14 MHz channel (see the ***Figure 1.6***).

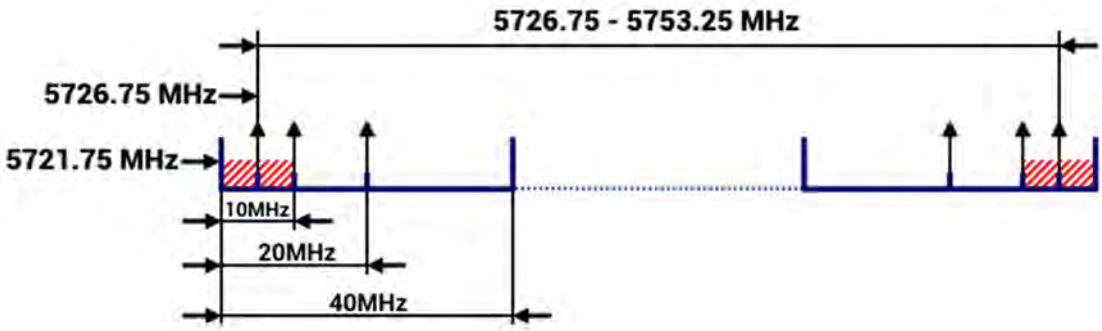

Figure 1.6 *Frequency range of the low side CFIP PhoeniX 18 GHz ODU*

Figure 1.6 explains Tx frequency range of low side CFIP PhoeniX 18 GHz radio.

1.7 Microwave Radiation

In April 1998, ICNIRP (International Commission on Non-Ionizing Radiation Protection) published its ´Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300GHz)´. As shown in Table below, the guidelines specify the ´Reference levels on power density for occupational exposure and general public exposure to time-varying electric and magnetic fields (unperturbed rms values)´ between 2 and 300 GHz.

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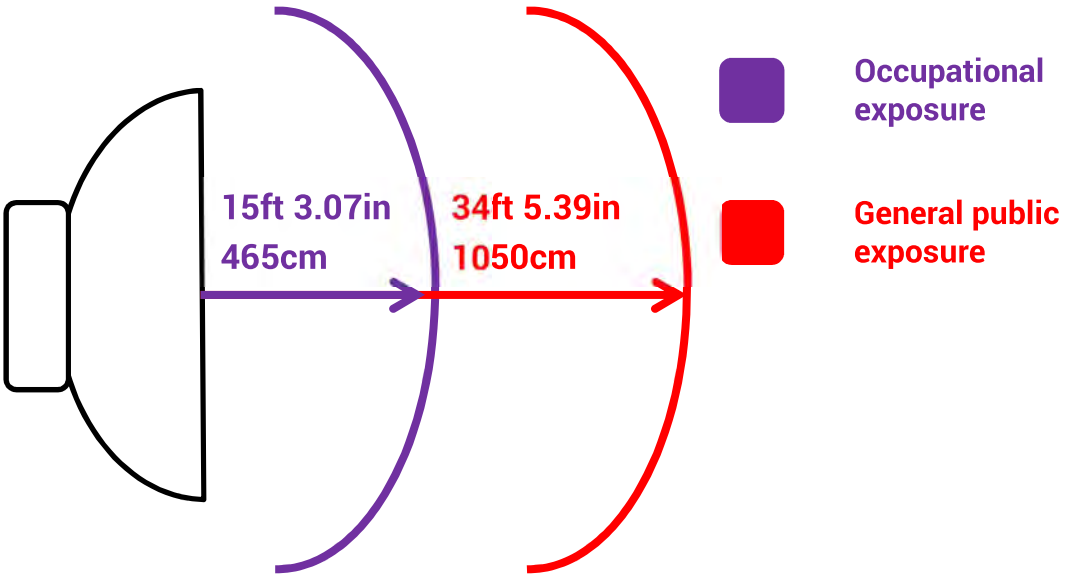

(!) It is the installer's responsibility to ensure compliance with the governing rules and regulations regarding output power and point-to-point installation and operation.

Quite a few other documents specify or refer to exposure limits comparable to those given above, e.g.:

- 1999/519/EC: Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic
fields (0 Hz to 300 GHz)
- WHO: Environmental Health Criteria 137: ´Electromagnetic Fields (300 Hz to 300 GHz)´
- ANSI/IEEE C95.1, 1999:
´IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz´
- BRD, Bundesimmissionsschutzgesetz, 26. BImSchV Verordnung über elektromagnetische Felder
- Bundesamt für Umwelt, Wald und Landwirtschaft (BUWAL), Bern/Schweiz
Schriftenreihe Umwelt Nr. 164, Luft, Mai 1992
´Messung nichtionisierender elektromagnetischer Strahlung, 1. Teil: Frequenzbereich 100 kHz bis 300 GHz´
- DIN VDE 0848-2, Entwurf, Oktober 1991:
´Sicherheit in elektrischen, magnetischen und elektromagnetischen Feldern, ´Teil 2: Schutz von Personen im Frequenzbereich von
30 kHz bis 300 GHz´
- ENV 50166-2, January 1995 (withdrawed in December 1999 by CENELEC)
´Human Exposure to Electromagnetic Fields (10 kHz – 300 GHz)´

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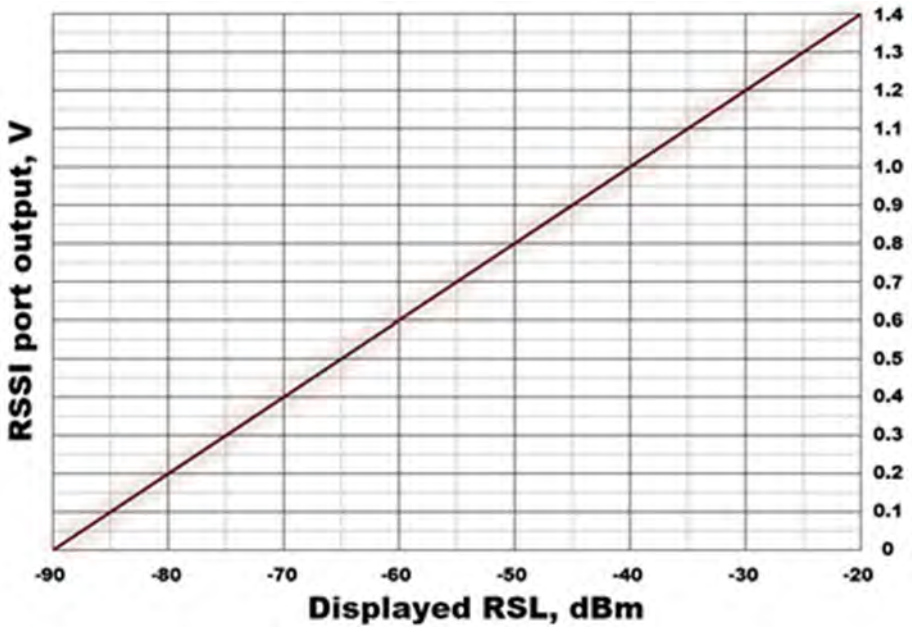
2 RSSI Port



ıt of antenna for best
ıl multimeter which is
epending on received

Displayed RSL, dBm	RSSI, V
-90	0
-85	0,1
-80	0,2
-75	0,3
-70	0,4
-65	0,5
-60	0,6
-55	0,7
-50	0,8
-45	0,9
-40	1
-35	1,1
-30	1,2
-25	1,3
-20	1,4

Figure 2.1 *RSSI chart*

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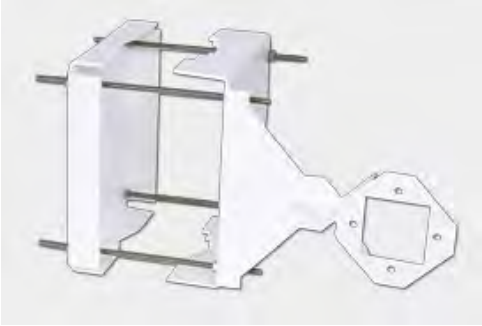
3 Available Accessories

Surge protection P/N: CLALA001	Surge Protection with gas tube P/N: CLALA003
	
CFIP ODU Mounting Bracket (for 1xODU P/N: CLGRFB05; for 2xODU P/N: CLGRFB06)	Flexible Waveguide UBR-PBR (See the list of available test equipment below)

3.1 Other Available Accessories

CFIP Test Equipment

P/N	Name:	Description
C06TST02	Test equipment 6 GHz	Test equipment 6 GHz

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4 SAF Tehnika JSC Contacts

SAF Tehnika JSC technical support can be reached by:

- Email: techsupport@saftehnika.com
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