

WIRELESS SOLUTIONS

FOR TODAY'S BUSINESS

REQUIREMENTS



The company

SAF Tehnika is a designer, producer and distributor of telecommunications and data transmission equipment. Our solutions are used by cellular network operators, data service providers (ISPs, telecoms and others), governments and private companies, as an alternative to cable channels.

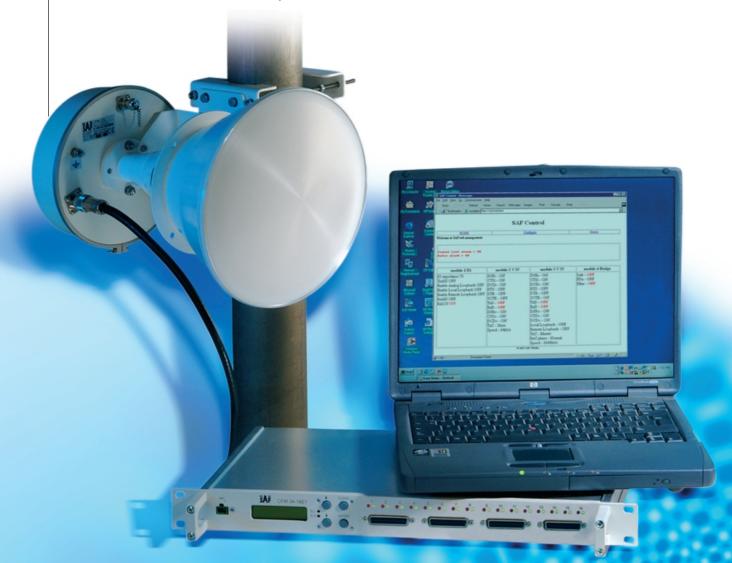
The company was founded in 1999 merging the best experience of two companies – SAF and Fortech, both working in wireless communication equipment development and distribution business from 1995. SAF Tehnika is a member of the MicroLink group, the leading IT holding company in the Baltics. Group's generated turnover exceeds 60 million EUR in FY 2001/02 with human resources of more than 600 people in Estonia, Latvia and Lithuania.

The firm is employing only highly qualified people who look after the products until they reach clients, from design stage to production, testing and delivery. Our R&D department employs engineers, with 5-10 years of experience in development of wireless equipment each. The needs of clients are our priorities, so there is an ongoing process of new product development and improvement of existing products. To achieve this, the company's specialists use the latest and most advanced technologies available.

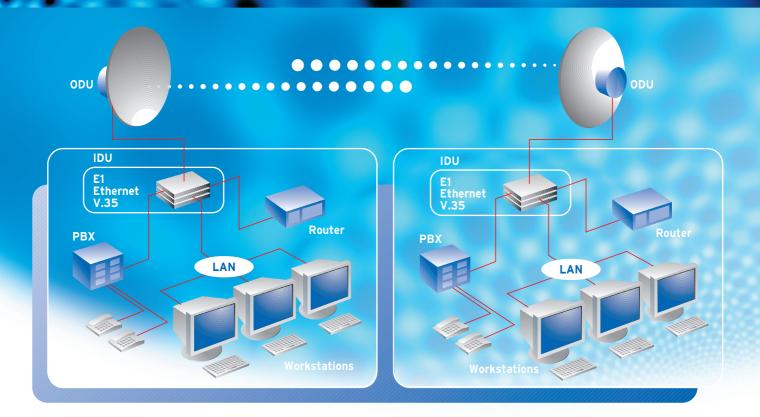
Thanks to our non-traditional approach our products offer:

- · excellent reliability,
- · accessibility of data and voice interfaces,
- · outstanding technical parameters for radio and data traffic interfaces,
- · low costs,
- · compact and handy design,
- low power consumption.

Through our distributors and partners, SAF Tehnika is active in the Baltics, Scandinavia, Britain and other EU countries, Eastern Europe and the CIS.



CFM network applications



CFM product line

The widespread and growing use of microwave radio equipment in modern voice and data networks well deserves to be called a phenomenon of the last decade of the 20th century and beginning of the 21th century. The reasons behind that are numerous, like:

- · increased demand for high data rate channels,
- · growing pressure on operators to shorten the deployment times,
- the need to shorten time of the return on investments,
- · changing demands for the services from the customers.

All of these issues are well solved using our wireless system CFM.

CFM is safe and economical wireless communications system operating in 13, 15, 18, or 23 GHz frequency bands and providing transmission of voice and data in both metropolitan and rural areas between sites up to 40* km apart. System has modular structure, which means it can be adapted for the specific needs of your business. The system comprises radio (antenna and Outdoor Unit - ODU) and interface (Indoor Unit - IDU) blocks. By choosing CFM with the appropriate interface you can build transmission systems for voice (E1), data (Ethernet or V.35), as well as combined solutions for voice and data combination (E1+Ethernet or V.35). CFM is available with 4, 8, 16 and 34 Mbps data transmission rate.

The new addition to the CFM product family is 2xE1 Full Outdoor Unit. System initially is designed to provide 4 Mbps of traffic capacity implemented as 2xE1 (G.703) channels. FO unit has ultra compact — "all in one" design, making this product perfect for mobile operators and other users who have no must in equipment located indoors.

It is important to add, that microwave radio channel quality is at least as high, as good quality cooper or fiber cable channel quality, if the radios are installed properly, it features ultra low error rates and very high channel stability.

A convenient and modern management system has been created to provide complete configuration, control and monitoring of the equipment in operation locally and remotely. Information on operations can be obtained from LCD display on the IDU or a computer monitor. The CFM management system utilises Web, SNMP and Telnet/Terminal interfaces, it is based on TCP/IP protocol. Feature rich loopback functionality is available for all models of CFM equipment. The radio, baseband and interface (E1 and V.35) loopbacks are provided for testing the channels for client convienience. The product is made in accordance with ETSI standards (EC R&TTE directive) and conforms to set requirements. CFM is CE marked. To fully appreciate the quality and advantages of this product, your company may use it for trial period. We are sure you will be completely satisfied.

* Depends on availability required, climatic zone, frequency band, system capacity etc.



Indoor Units

Ethernet Indoor Units

Cresification	Capacity				
Specification	4 Mbps	8 M			34 Mbps
Indoor Unit type	Remote Ethernet	Remote Ethernet	Modular Remote	Modular Remote	Modular Remote
	Bridge	Bridge II	Ethernet Bridge	Fast Ethernet Bridge	Ethernet Bridge
Model name	CFM-4-REB	CFM-22 REB II	CFM-8-REB M	CFM-16 REB M	CFM-34 REB M
			Fixed 10/100	Fixed 10/100	Fixed 10/100
			Ethernet Port	Ethernet Port	Ethernet Port
			+2 slots for E1,	+2 slots for E1,	+2 slots for E1,
Configuration options	Fixed configuration	Fixed configuration	V.35 or additional	V.35 or additional	V.35 or additional
			Ethernet modules	Ethernet modules	Ethernet modules
			(4+2+2;	(12+2+2;	(30+2+2;
			6+2; 8 Mbps)	14+2; 16 Mbps)	32+2; 34 Mbps)
Compatibility with	CFM L4	CFM LM	CFM LM	CFM LM	CFM LM
following CFM Radio					

Indoor Units with E1 Interface

Cresification	Capacity				
Specification	4 Mbps	8 Mbps	16 Mbps	34 Mbps	
Indoor Unit type	2xE1 Indoor Unit	4xE1 Indoor Unit	8xE1 Indoor Unit	16xE1 Indoor Unit	
Model name	CFM-4-2E1	CFM-8-4E1	CFM-16-8E1	CFM-34-16E1	
Configuration options	Fixed configuration	Fixed configuration	Fixed configuration	Fixed configuration	
Compatibility with	CFM L4	CFM LM	CFM LM	CFM LM	
following CFM Radio					

Modular Indoor Units

Cassification	Capacity			
Specification	8 Mbps	16 Mbps		
Indoor Unit type	Modular Flexible Multiplexer	Modular Flexible Multiplexer		
Model name	CFM-8-MUX	CFM-16-MUX		
Configuration options	It is possible to combine 1-4 Ethernet, E1 and V.35	1 Fixed 8 Mbps slot for Ethernet or V.35		
	modules (slots using 1x8 Mbps; 4x2; 6+2; 4+2+2)	module + 3 configurable slots for combining Ethernet,		
		V.35 modules (slots using 1x8 Mbps; 6+2; 4+2+2; 3x2)		
Compatibility with	CFM LM	CFM LM		
following CFM Radio				

Full Outdoor Unit

1	Specification	Capacity			
4		4 Mbps			
//	Unit type	2xE1 Full Outdoor Unit			
//	Model name	CFM-13-F02E1; CFM-15-F02E1; CFM-23-F02E1			
//	Configuration options	Fixed configuration			
	Compatibility options	CFM L4			

Main advantages of CFM

- Excellent reliability,
- Flexible interface adjustable for client needs,
- User friendly management system,
- Good price,
- Simple and quick installation,
- Total system integration savings

We are offering to clients

- Flexible business approach and continuous support,
- Fast warranty and after sales service



Technical specifications

CFM LM Outdoor Unit

 	<i>[[1]</i>			//////////////////////////////////////	
Specification		13 GHz	15 GHz	18 GHz	23 GHz
Frequency bands (GHz)		12.75-13.25	14.5-15.35	17.7-19.76	22.0-23.6
Duplex spacing (MHz)		266	420/728	1010	1008
Channel spacing (MHz): Capacity 8/16/34 Mbps		7/14/	7/14/28	/13.75/27.5	7/14/28
Receiver Threshold (dBm)	:				
Capacity 8/16/34 Mbps	BER 10 ⁻³	-84/-81/	-84/-81/-78	/-80/-78	-84/-82/-79
	BER 10 -6	-81/-78/	-81/-78/-75	/-77/-74	-80.5/-78.5/-75.5
Transmitter power (dBm)		+20	+20	+19	+19
Waveguide flange		UBR 140	UBR 140	UBR 220	UBR 220
Antenna gain (dBi)	0.25 m	-	-	32.8	34.0
	0.3 m	-	32.2	32.9	35.0
	0.6 m	36.0	36.9	38.3	39.9
	1.2 m	42.0	43.0	44.3	45.9

CFM L4 Outdoor Unit

Specification		13 GHz	15 GHz	23 GHz
Frequency bands (GHz)		12.75-13.25	14.5-15.35	22.0-23.6
Duplex spacing (MHz)		266	420/728	1008
Channel spacing (MHz):				
Capacity 4 Mbps		3.5	3.5	3.5
Receiver Threshold (dBm):	:			
Capacity 4 Mbps	BER 10 ⁻³	-86	-86	-87
	BER 10 ⁻⁶	-83	-83	-83.5
Transmitter power (dBm)		+20	+20	+19
Waveguide flange		UBR 140	UBR 140	UBR 220
Antenna gain (dBi)	0.25 m	-	-	34.0
	0.3 m	-	32.2	35.0
	0.6 m	36.0	36.9	39.9
	1.2 m	42.0	43.0	45.9

Common features

Modulation	4 FSK			
Frequency stability	+/- 10 PPM			
Transmitter power attenuator	-10 to +20 dBm; 1dB step			
Max. input power at antenna port	+15 dBm			
Background BER	<10⁻¹¹			
Spurious emissions at antenna port	30 MHz to 21.2 GHz: <-50 dBm / 21.1 GHz to 55.0 GHz: <-30 dBm			
Cable (IDU-ODU): single coaxial	Single up to 300 m long (LMR 400) or up to 100 long (RG-213), N-type connectors			
Standard compliance	ITU, ETSI			
Mechanical parameters mm/weight kg	ODU: 280x85 / 2.5; IDU: 483x290x43 / MAX 2.1			
Ambient Temperature	ODU: -33°C to +40°C; IDU: -5°C to +40°C			

 $\ensuremath{\mathsf{All}}$ equipment specifications are subject to change without prior notice.

To find out more visit us on web site - www.saftehnika.com. We will also be glad to provide you with information about the prices and answer your questions by e-mail: sales@saftehnika.com







