

## Brief Specifications

Transmission Mode	Solid State Analog FM Radio Broadcasting			
Cooling System	Open loop or pressurized closed loop liquid cooled system using appropriate mixture of water and Antifrogen-N as the coolant Automatically controlled thermostatic mixing valve High quality, high efficiency Heat Exchanger with automatically temperature controlled cooling fans Redundant Pump Unit includes temperature, pressure and min/max coolant level sensors with Smart Standalone Cooling Control Unit Configurable to be implemented inside/outside of the transmitter Rack			
Operation Temperature Range	0°C to 45°C			
Storage Temperature Range	-20°C to 55°C			
Relative Humidity	Up to 95% Non-Condensing			
Altitude	Up to 2000m A.M.S.L.(up to 3000m on request)			
Electrical AC Supply	Single phase 220Vac $\pm$ 15% or four wire three phase 380Vac $\pm$ 15%, 50Hz $\pm$ 2% with more than 90% power factor			
Automatic Power Control	The automatic power control circuitry provides the output power regulation with a stability of $\pm$ 2% over the time and whole FM frequency range and protects the system against open or short circuit, capable of withstanding a VSWR up to 1.5:1 at nominal power without power reduction, 1.5:1 up to 2.5:1 with appropriate power reduction and Automatic RF shutdown with five recycling times above 2.5:1			
Type of Modulation	Mono, Stereo + RDS			
Frequency Drift	< 200Hz / 3 Months			
RF Harmonic and Spurious Suppression	>80 dBc (Exceeds EBU/CCIR/FCC Requirement)			
Asynchronous AM SNR	>60dB			
Synchronous AM SNR	>55dB			
Emission	FBE Mono and F3E Stereo complies with ITU-R BS.450-3			
Frequency Deviation	$\pm$ 40KHz to $\pm$ 150KHz, User adjustable			
Pre emphasis	Flat,50 $\mu$ s and 75 $\mu$ s Selectable			
Local Control and Operation Interface	Status LEDs, Buttons and Touchscreen Display Unit			
Remote Control and Operation Interface	Web GUI over RJ-45 Ethernet Port, GSM modem and antenna(on request)			
Available Customized Models	FA4KLCFMTx01	FA4KLCFMTx02	FA4KLCFMTx03	FA4KLCFMTx04
Number of SSPAs	1	2	3	4
Analog FM Output Power	3.2 kW	6 kW	9kW	12kW
Frequency Range	87.5 to 108MHz with Synthesized 10 kHz Steps			
Channel Bandwidth	200 kHz			
Inputs	Analog Audio L & R, Digital AES/IEBU, MPX,RDS,SCA			
RF Output	1 5/8" EIA		3 1/8" EIA	
Efficiency	72%			
Power Consumption	5KVA	10KVA	14KVA	19KVA
Dimensions(H x W x D)	210cm x 60cm x 110 cm			
Number of Tx available per Rack	Up to 3	Up to 2	Just 1	Just 1



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## Liquid Cooled FM Transmitter

FA4KLCFMTx Family

High Efficiency, High Power Density, Compact Footprint

## Key facts:

- Features energy efficiency up to 72%
- Delivers up to 12 kW output power per rack
- Performs fully redundant built-in pump unit
- Reduces installation costs thanks to compact footprint
- Provides easy installation, service and low maintenance costs thanks to modular system design
- Could be configured as Single Drive or Dual Drive with Automatic Change Over Unit
- N+1 redundant system configuration is available
- Sourced from innovate fully hot-pluggable 3.2kW power amplifiers have been blended with built-in high efficiency power supplies
- Utilizes the Extremely Rugged 50 V LDMOS technology
- Prepared very low loss, high quality Progressive Transmitter Power Combiner has been realized with small footprint built-in liquid cooled Absorber Load Unit
- Incorporates best in class FM Exciter providing excellent on-air sound quality with built-in Stereo and RDS Encoder
- Fully broadband 87.5 to 108 MHz without any requirement to trimming or part replacement thanks to innovate System Management Unit
- Provides full task system control and monitoring with user friendly GUIs (locally or remotely via a computer from anywhere in the world) thanks to its task oriented System Management Unit
- Proudly offers extreme robustness and low service costs due to innovate system design

## Company at a glance

Fara-Afrand was founded in 1999 as an independent, privately owned company. Fara-Afrand puts science to work by manufacturing robust, reliable and innovate solutions for on-air broadcasting systems. Concentrating more than 18 years on broadcasting transmitters, makes Fara-Afrand to a reliable supplier, offers a wide variety range of innovative products and services for markets including broadcasting systems, communication systems, telecom, ISM and electronic solutions. Up to day more than 2K transmitter blocks of the company has been launched at many broadcasting stations, playing Digital and Analog Radios and Televisions in whole broadcasting frequencies from few MHz up to 1GHz with a few watts of power up to ten kilowatts.

## FA4KLCFMTx Family

FA4KLCFMTx is designed to meet high power requirements of the market in Radio FM Transmitters. Innovate and compact design of FA4KLCFMTx, offers a small footprint and high power density with excellent energy efficiency, such that all in one 12 kW transmitter is available within a 19 inch rack. Thanks to Extremely Rugged 50 V LDMOS technology, FA4KLCFMTx family prepares a robust, rugged and reliable solution for high power radio transmitters with dramatically reduced cost of ownership and maintenance of the transmitter.

## FAFM4KLC Solid State Power Amplifier

FA4KLCFMTx family provides high power density, efficiency and reliability, due to its fully hot-pluggable power amplifier. FAFM4KLC is a solid state power amplifier with built-in high efficiency power supplies. Thanks to its compact design and last generation Extremely Rugged 50 V RF LDMOS usage, 3.2 kW RF power could be achieved in a 3HU, 19 inch and 53cm box. Low loss RF low pass filter, power combiner, agile amplifier control unit and appropriate RF driver amplifier, also have been housed in the amplifier box. Innovate and compact design of FAFM4KLC, make it to a high efficiency small footprint SSPA that could be launched only with 1mw RF input signal to achieve more than 80% efficiency at 3.2kW output power.

## FAFME001 Exciter

FA4KLCFMTx family has been powered by the best in class FAFME001 Exciter with excellent quality on-air performance. For extra redundancy, the transmitter could be configured as Dual Drive Mode with Automatic Change Over Unit. FAFME001 supports RDS and accepts both Analog and Digital Audio inputs. High quality RDS and Stereo Encoder has been realized inside the FAFME001.

## Fully Redundant Pump Unit

FA4KLCFMTx family has been accomplished with a reliable cooling unit has been housed inside the transmitter rack. Utilizing cooling system with appropriate liquid sensors such as coolant temperature, pressure, level sensors, combined with use of a very agile and smart control unit make it to a very reliable system. Preparing the system with a spare pump block in the pump unit lets the control unit to drive the transmitter even with the main pump failure. Also, cooling system contains a thermostatic valve that has been controlled by the cooling control unit to gain better cooling efficiency in all temperature conditions. High quality, high efficiency Heat Exchanger with automatically temperature controlled fans, at the end of the line, allows heat to pass away from the transmitter.

## Low Loss Progressive RF Power Combiner

FA4KLCFMTx family uses an extremely low loss, high quality RF power combiner with excellent phase /amplitude balance and isolation between combining ports. Thanks to progressive implementation of the combiner, combining system needs lower capacity absorber loads. Combining absorber loads also has been realized as built-in liquid cooled units, inside the transmitter rack.

## Agile System Management Unit

FA4KLCFMTx family uses an agile System Management Unit. Well done user friendly menus and GUIs make its control or monitoring very easy and powerful. Stand-Alone realization of the transmitter blocks such as power amplifiers, exciters, cooling unit and etc., makes the System Management Unit very agile and powerful such that each transmitter block executes the System Control Unit instructions, without any overhead have been applied to it. Each transmitter block transmits its real time status to the System Management Unit and receives and executes its task and part oriented instructions via robust protocols like CAN. System Management Unit prepares full task control and monitoring of the transmitter and all of its blocks with all of their detailed parameters, via a 7 inch touchscreen display and associated keypad combined with user friendly menus and GUIs for local operation. In the remote mode, prepared system Ethernet port is playing the role to establish a bridge connection to the transmitter via a computer from anywhere in the world. Also a GSM modem and antenna could be configured inside the System Management Unit to establish a connection over the GSM network, for full task control and monitoring of the transmitter.

