



Specifications

Antenna System Parameter	Digital DRM	Analog AM
Modulation	DRM standard (ETSI ES 201 980)	DSB: A3E (option A3E with DCC or AMC)
Frequency Range (MHz)		2.3 MHz ÷ 12.1 (standard) 13.57 MHz ÷ 26.1 MHz (optional)
RF Output Power	peak power: 6.5 kW / 13 kW / 26 kW / 52 kW / 104 kW mean power (with 9 dB crest factor): 0.8 kW / 1.6 kW / 3.2 kW / 6.4 kW / 12.8 kW	AM carrier power: 1.5 kW / 3 kW / 6 kW / 12 kW / 25 kW
Output Impedance		50 Ohm
Permissible VSWR		2.0 at 50 Ω unbalanced
Mains Power Supply		400 V, 3-phase and neutral
Frequency		Frequency 50 or 60 Hz (± 2Hz)
Overall Efficiency at Pnom	≥ 70 %	≥ 80 %
Performance	Out of Band: Compliant ETSI EN 302 245-2 MER: ≥ 30 dB Compliant ETSI EN 302 245-2 (for bandwidth up to 10 kHz)	AF response: ± 1 dB (50 ÷ 10'000 Hz) AF distortion: ≤ 2.5 % (50 ÷ 10'000 Hz) Noise level: ≤ -62 dB rms unweighted
Audio Input	DRM/MDI	Analog: 0 ÷ 20 dB into 600 Ω balanced Digital: AES3, IEC 60958 and EBU 3250
Local Operation		Local control through push buttons 19" touch-screen optional
Remote Control & Supervision		Ampegon MasterSeries II software, Web-Interface, SNMP V2c
Environmental Conditions		Ambient temperature: +1° ÷ +45° C Maximum humidity: 95 % non-condensing
Dimensions		LxWxH: 1.5 / 6 kW 1000 mm x 600 mm x 2150 mm LxWxH: 12 / 25 kW 1000 mm x 1200 mm x 2150 mm
Personnel Safety		IEC 215, EN 60215

Options

- 19" touch-screen operating interface
- Redundant synthesizer
- Redundant power supply configuration
- 2nd broadcast bandfilter output filter
- 3rd broadcast bandfilter output filter
- 4th broadcast bandfilter output filter
- Integrated DRM modulator

Contact

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The Heartbeat of High Power



Solid-State Shortwave Transmitter Line

TSW 1.5 / 3 / 6 / 12 / 25 kW AM carrier power

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Solid-State Shortwave Transmitter Line

1.5 / 3 / 6 / 12 / 25 kW

Ampegon shortwave transmitters have been leading the market for more than 70 years and are the best choice for economical, efficient and flexible broadcast operation.

True to our tradition of combining innovative technology with reliable and well proven techniques, Ampegon has developed a new fully solid-state shortwave transmitter with integrated DRM solutions. The Ampegon solid-state shortwave transmitters are designed and produced in our factory in Switzerland to meet the highest quality and industrial design standards. Ampegon's low power solid-state transmitter line ranges from 1.5 kW to 25 kW AM carrier power. As a proud founding member of the Digital Radio Mondiale (DRM) Consortium, Ampegon strongly supports the digital broadcasting system.

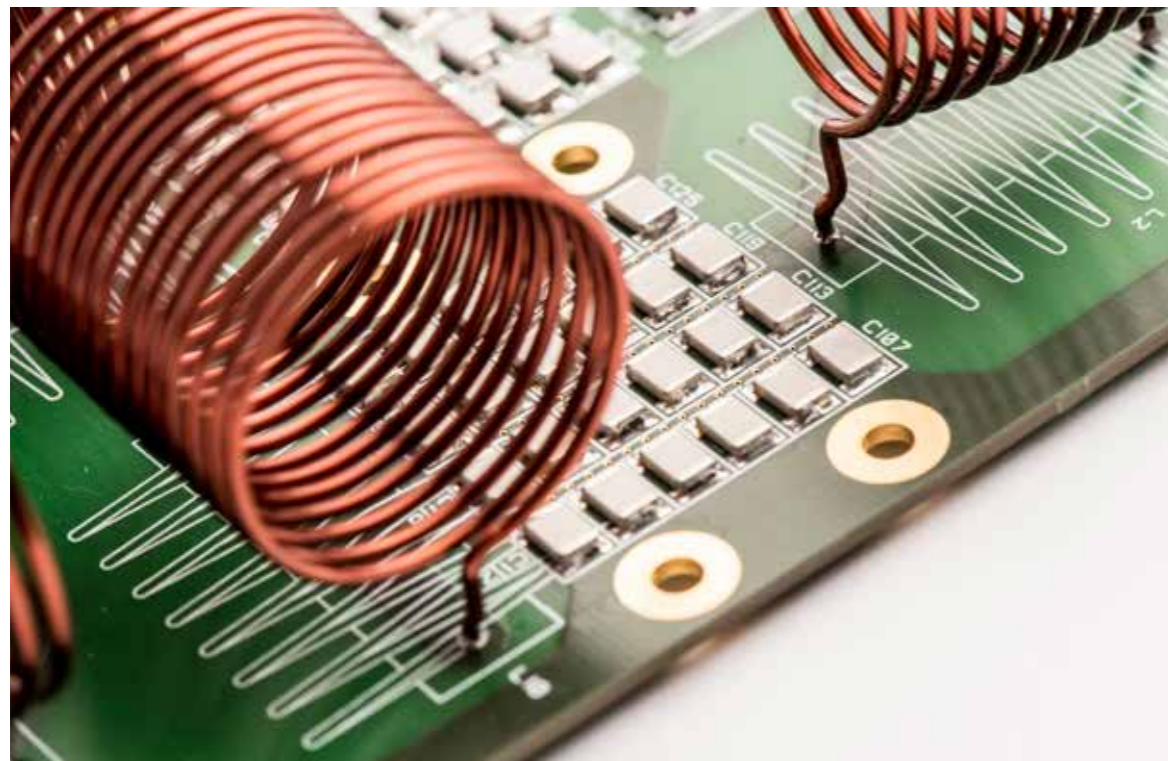
Therefore, the Ampegon TSW product line is fully DRM compatible and enables broadcasters to choose between classical AM analog and/or DRM digital operation. A small footprint and simple installation and commissioning time make this member of the Ampegon shortwave family truly unique. The entire modulator and RF section is air-cooled and based upon the latest development in fast switching mode amplifier class E technology, and is built into one single transmitter cabinet. The new Ampegon

Unified Control System platform (UCS) is used to oversee operation of the transmitter with all the well known advantages of a single common interface and in-house platform development.

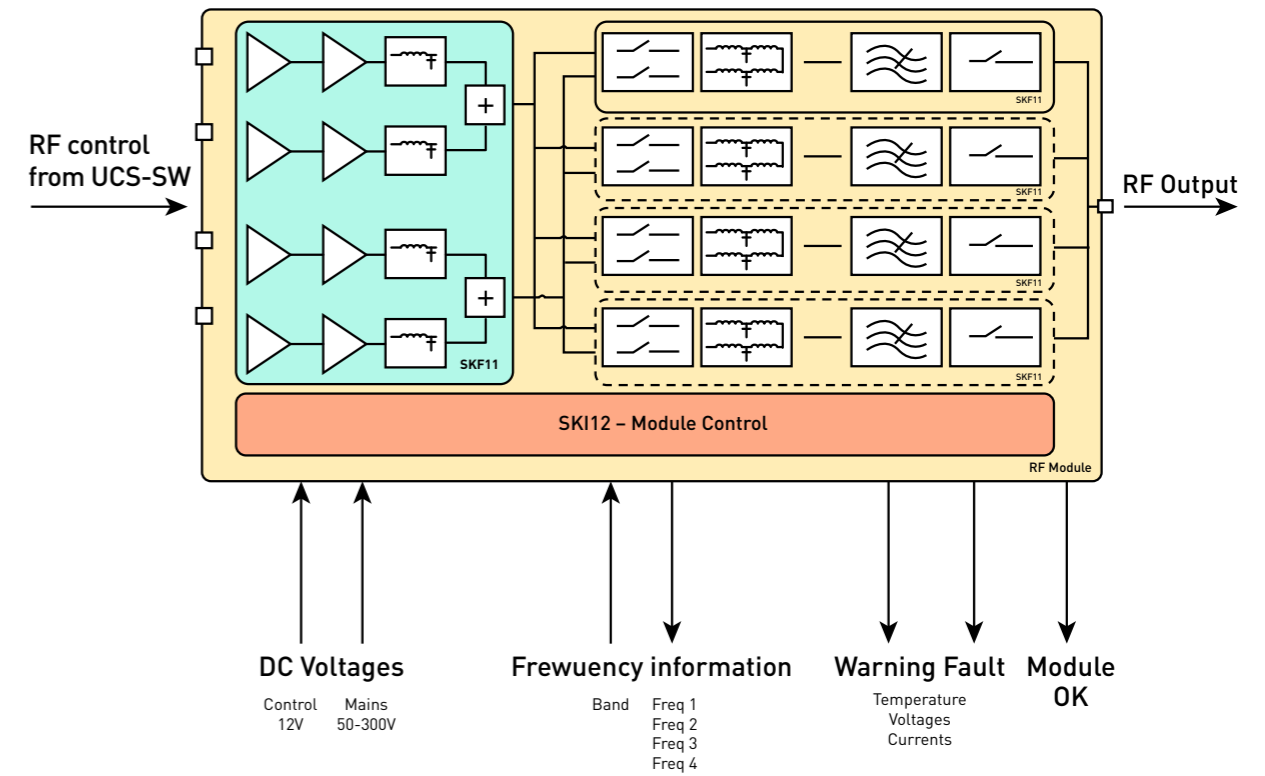
Line Radio Frequency Stages and Solid-State Amplifier (SSA) Modulator

The transmitters are designed and built from first principles using only solid-state technology. Central to the design is a class E push-pull amplifier concept, which is based on the in-and-out phasing method. The modulation is realized over the fine adjustment of the out phasing angle between the two push-pull modulator blocks. The modular combining of amplifiers allows customers to specify transmitters for any power class. The combining network and up to four dedicated frequency slots allow a fast changeover and flexible broadcast schedule setup.

At the heart of every TSW solid-state transmitter are redundant, equal and powerful, solid-state class E amplifier modules. As the industry leader in shortwave technology, our solutions enhance your broadcasting capabilities with their outstanding distortion and signal-to-noise specifications. The high efficiency (> 80 %) and power factor (> 0.97) of the supply unit result in minimal energy consumption and operating costs.



RF Output Network for Solid-State Amplifier.



Block diagram of Solid-State Shortwave Transmitter.

New Generation Transmitter Control System UCS

The new UCS transmitter control system (Unified Control System) sets new standards for shortwave transmitters. This control system features the latest embedded PC and FPGA technology. The interaction with the various subsystems is based on a network distributed Middleware solution and a sophisticated HMI represents the link to the operator. In order to facilitate the various monitoring, control and processing purposes, a modular concept is used which consists of dedicated subsystems.

The UCS SW for shortwave applications is the heart of the new control system. It is capable of generating highly accurate RF signals with highest stability and achieving fast direct sampling for RF measurement purposes. The control system comprises the complete audio signal processing path required for shortwave transmission, such as adjustable analog and digital audio inputs, dedicated audio filters, modulation mode and more. The optionally installed embedded DRM modulator completes the entire range of modulation schemes.

Analog interfaces, which include fast acquisition channels, allow alarm- and failure-detection within the broadcast transmitter. The UCS system controls the RF power modules. It calculates the phase level of the pushpull amplifier required to provide the output voltage, based upon a reference signal and feed forward regulation. The wide range and fast processing of the reference inputs allows modulation frequencies suitable for analog and digital modulation.

A state-of-the-art safety system is also included in the control system. This operates completely independently in order to ensure unconditional safety and simple operation according to the IEC 215 safety standards. However, the dedicated communication interface guarantees interaction with the transmitter control system. The integrated tuned output filters allow fast and accurate selection of the broadcast band and operating frequency with full digital control. This leads to comfortable and fully automated frequency changes supporting the customer for best on air performance.