

1.2 General description.

The EM-100 DIG is a 100W rated, direct-synthesis, FM-modulated transmitter. Being digitally controlled, it is extensively put on the air on field by front panel or remotely in additional aspects: frequency, power, channel sensitivity, pre-emphasis, functioning mode (mono, stereo, external mpx), clock and date and many other parameters without adjusting or substituting any part. A powerful 3-level password management permits a very high degree of security and privacy as may be required in different situations. Equipment requires little or no maintenance and its simple modular layout facilitates stage testing and servicing.



Figure 1-1: EM-100 DIG DIGITALLY-CONTROLLED F.M. TRANSMITTER.

As imposed by various national standards, these transmitters incorporate sophisticated low-pass audio filters on mono and stereo channels, and a sharp acting modulation limiter, which is usually set at a peak deviation slightly higher than 75kHz. Its intervention may nevertheless be avoided, if required, pre-setting its threshold at a deviation higher than 150kHz. Output frequency is phase-locked to a temperature-compensated crystal oscillator, which ensures superior precision and stability. A very low noise, low distortion VCO produces a harmonic-free, spurious-free signal. A lock control circuit inhibits the presence of power on the output until the apparatus is on the right frequency, when turning on.

To reach a further lowering of noise threshold, the low-frequency inputs are fitted with balanced input circuitry. The input level is precisely adjustable over a broad range, by means of a 0.5dB stepwise variable attenuators. The transmitter has an auxiliary input, specifically designed for RDS and SCA encoders. A modulation sample output permits to control other transmitters or STL's with the same internally processed high-quality mpx signal.

The alphanumeric display permits easy and accurate metering, adjustment and continuous monitoring of modulation levels, power, operation and internal parameters. All these information may be externally available on the same RS-232 I/O bus that may be used to remotely control the transmitter.

Above Figure 1-1 shows us the external view of Transmitter's cabinet, whose control panel has been simplified to a maximum, being Microcontroller in charge of practically to select and make all tests and adjustments of all parameters that are relevant to the normal Equipment's performance. Due to this fact, Front Panel has only a few control elements, since with only the four push buttons pertaining to Microcontroller (like those used to control movement of cursor in a Computer) and two keys, these virtually controlling all processes & parameters having place within Equipment. Microcontroller uses a Liquid-Crystal dot matrix as Alphanumeric Display unit in order to watch parameter's values, as it's asked for it, as can be seen in the corresponding Chapter in this Manual.

In addition to the serial I/O port, some signals (RF power, ON THE AIR status, Disable line) are available on a parallel I/O remote socket for easy interfacing with others analog controllers or supervisory systems. A top-quality stereo encoder may be factory installed as option and even retrofitted in the field in a second time, requiring minimum technical skill. The powerful internal software and monitoring functions recognizes its presence and enables its functions.

The RF power amplifier employs a broadband design and has a lot of reserve: the output power is feedback-controlled for increased stability still higher than nominal level. High reflected power is limited to prevent output stage degradation; direct power is accordingly continuously reduced so as not to exceed the reflected power safety level. A sturdy telecom-grade high efficiency switch-mode power supply allows operation in a very wide and noisy mains environment.



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