WORLDCAST SYSTEMS

3kW

TECH NOTE

What Happens if...?

A Study of the Redundancy Capabilities of the Ecreso FM 3kW Transmitter

Includes Expected RF Output Recovery Power Table

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A Study of the Redundancy Capabilities of the Ecreso FM 3kW Transmitter

TECH NOTE

The ECRESO FM 3kW offers a high level of built-in redundancy. Its unique design and performance is inspired by the disruptive approach "as solid as a 1+1" developped on the Ecreso FM 5 and 10kW.

This document aims to show how the Ecreso FM 3kW performs in the event of various types of failures and the power output which you can still expect depending on the system you deploy.

For a better understanding of this innovative redundancy approach, we strongly recommend reading the previous 5 and 10kW Tech Note "How Intelligent Transmitter Design Can Deliver 1+1 Levels of Performance"

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Available versions of the Ecreso FM 3kW

Before beginning the analysis, it is necessary to define the three systems which are compared in the table that follows.

Ecreso FM 3kW - Standard Version

This system is supplied with:
- 2 hot swappable 3500W power supplies
- 3 RF amplifier modules
- 4 hot swappable fans

Ecreso FM 3kW + 1 additional PSU

This system is supplied with:
- 3 hot swappable 3500W power supplies
- 3 RF amplifier modules
- 4 hot swappable fans

1+1 Ecreso FM 3kW

This system is supplied with:
- 2 Ecreso FM 3kW (standard version described above)
- 1 Ecreso Control Unit
- 1 RF Switch

RF Output Recovery Scenarios

The following tables provide the typical RF output power values that can be expected, in different scenarios concerning the loss of various components.

We can see that the Standard version will continue to broadcast above -3dB even when a power supply, a MOSFET, or fan is lost. Higher redundancy is acheived by adding a PSU. The complete 1+1 (or N+1) system is used for extremely redundant application cases.

All values listed have been observed following a short recovery time. For example, in the case of a MOSFET loss, a short time is required to increase power on the other modules.

Moreover, the transmitter keeps operating indefinitely at the indicated power level.

	Ecreso FM 3kW Standard Version	Ecreso FM 3kW + 1 additional PSU	1+1 Ecreso FM 3kW
Recovery case	**TF01072**	**TF01072 + AL00122**	**TF01113**
Nominal	3000 W	3000 W	3000 W
Control Unit	N/A	N/A	3000 W
1 PSU	≈ 1900 W	3000 W	3000 W
1 MOSFET	≈ 1600 W	≈ 1600 W	3000 W
1 Fan	3000 W	3000 W	3000 W

Typical output power observed in standard operating conditions, 98MHz, 25°C

Combination of Several Failures

The Ecreso FM 3kW has been designed with separate, robust modules to avoid domino effects. While the probability of several failures occurring at the same time is very low, we still need to have confidence in the performance of our FM transmitter, should the worst happen. The following table provides the typical output power in those very extreme cases.

The table even looks at some highly unlikely scenarios where failures from different stages are combined or there are large multiples failures at once. This may be of practical use perhaps only to the most unlucky of broadcasters but serves as a useful illustration of the robustness of the Ecreso FM 3kW to the vast majority.

	Ecreso FM 3kW Standard Version	Ecreso FM 3kW + 1 additional PSU	1+1 Ecreso FM 3kW
Recovery case	TF01072	TF01072 + AL00122	TF01113
2 Fans	≈ 3000 W	≈ 3000 W	3000 W
2 PSU	0 W	≈ 1900 W	3000 W
1 Fan & 1 PSU	≈ 1900 W	3000 W	3000 W
1 PSU & 2 Fans	≈ 1900 W	3000 W	3000 W
1 PSU & 1 MOSFET	≈ 1600 W	≈ 1600 W	3000 W
1 PSU & 1 MOSFET & 1 Fan	≈ 1600 W	≈ 1600 W	3000 W
1 MOSFET	≈ 1600 W	≈ 1600 W	3000 W
2 MOSFET	≈ 500 W	≈ 500 W	3000 W

Typical output power observed in standard operating conditions, 98MHz, 25°C

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