

SMARTFM[®]

WBA presentation – 09/08/2021
By Tony Peterle
t.peterle@worldcastsystems.com

SUMMARY

Introduction

How does it work?

What are the benefits?

SmartFM ecosystem

Get SmartFM





1 INTRODUCTION

Smart FM – Artificial Intelligence for FM Broadcast:

SmartFM is a worldwide patented technology developed by WorldCast Systems.



LOWERS ENERGY COSTS

- Reduces electrical consumption by 10% to 40%*
- Reduces cooling costs by up to 45%*
- Increases transmitter lifespan
- Reduces maintenance



REDUCES CO2 EMISSIONS

- Measurable and logged benefits
- Guaranteed return-on-investment

*Ask us for a complete presentation and customized estimation

INTRODUCTION

During the last few decades, there have been substantial improvements in FM transmitters:

- LDMOS technology,
- Built-in features,
- Compact designs
- ...

Despite these advancement, LDMOS technology has reached its maximum potential for improving transmitter efficiency

So how can our industry become more energy efficient?

Artificial Intelligence for FM Broadcast

Our Founder, Daniel Werbrouck, had an idea about controlling the signal of an FM transmitter based on modulation and other factors, to save energy.

Then came 3 years of intensive research and development...



...that have resulted in:

- o A patent (France + World)
- o Several field tests and broadcasters ON AIR with SmartFM
- o The 1st artificial intelligence dedicated to FM listening experience

SmartFM is a breakthrough innovation which brings benefits to broadcasters and their listeners.

THEY TESTED AND APPROVED SmartFM

>40 broadcasters are or have tested SmartFM and >20 are On Air

BECAST: French measurement expert, ex: Lagardere

ITELAZPI has approved the technology. → [Press release](#)

BCAST & Radio Maridja (Poland) → [Press release](#)

BROADCAST PERU

CELLNEX: Tests in progress so far so good.

Uplink (Germany)

Sentech (South Africa)

USA: Successful test, looking for other ~~victims~~ pioneers!

...

2 HOW DOES IT WORK?

How does it work?

SmartFM technology is based on predictive algorithms and psychoacoustic analysis of the broadcast signal.

It then allows, in real-time, optimization of the RF level with no compromise on the program quality, over the coverage area.

Note: The audio is NEVER modified by SmartFM, only analyzed

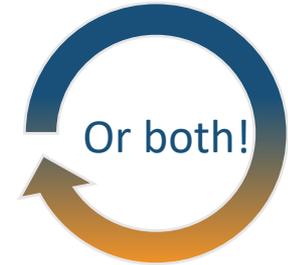
How does it work?

You can chose between two main power management strategies :

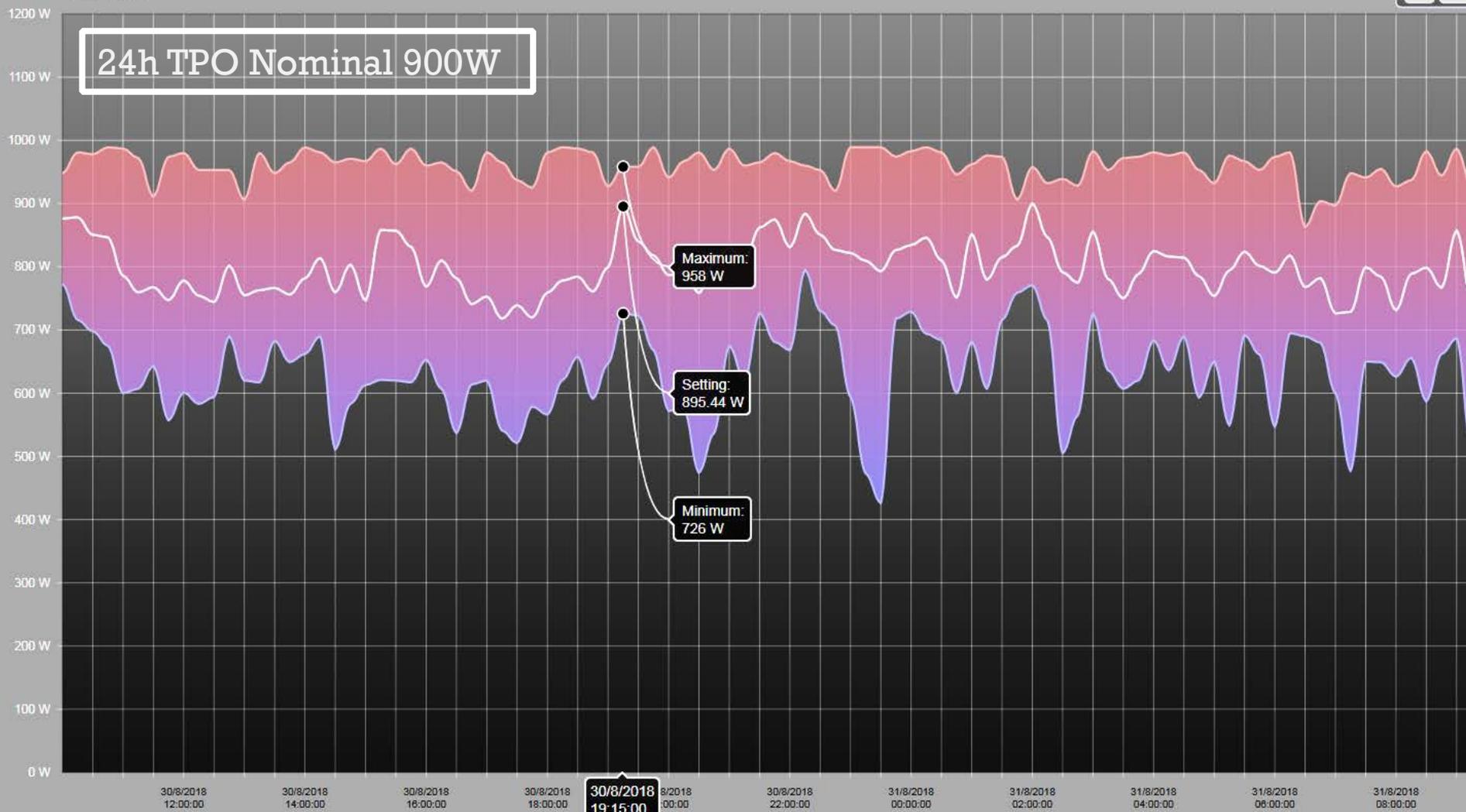


Improve the reception quality to your listeners especially sensitive contents at the limits of your coverage.

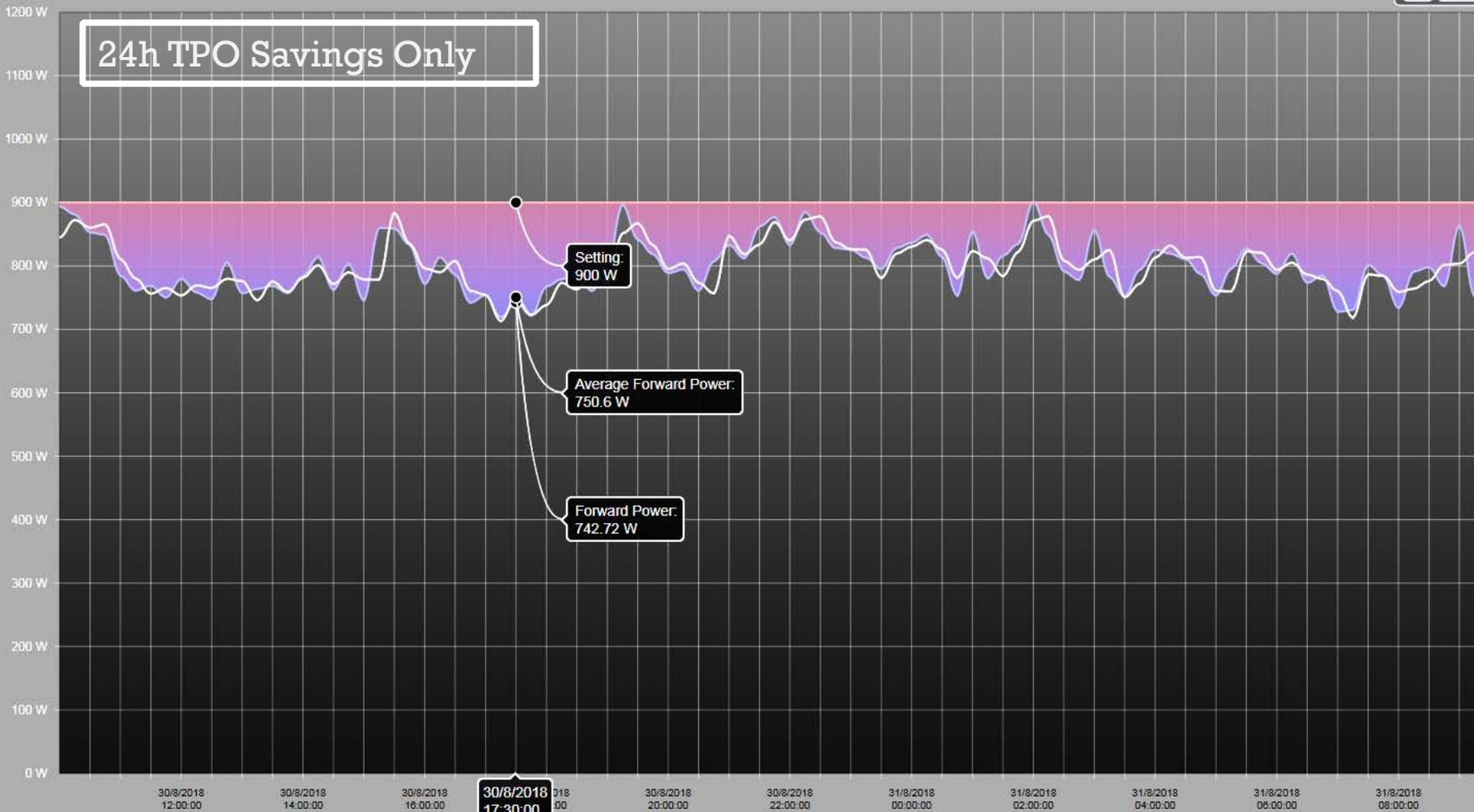
Reduce energy costs by up to 40% without compromise for listeners.



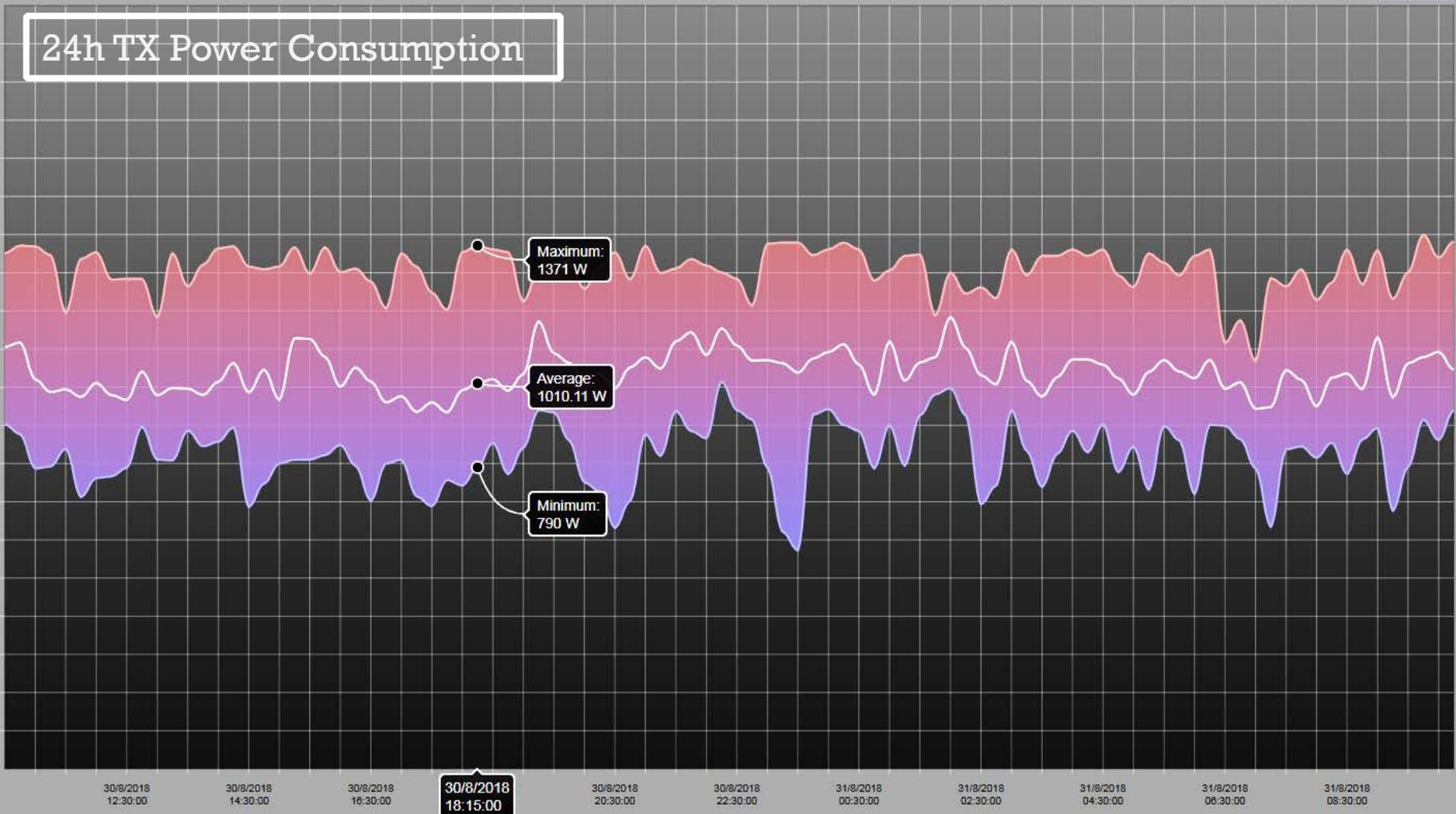
24h TPO Nominal 900W



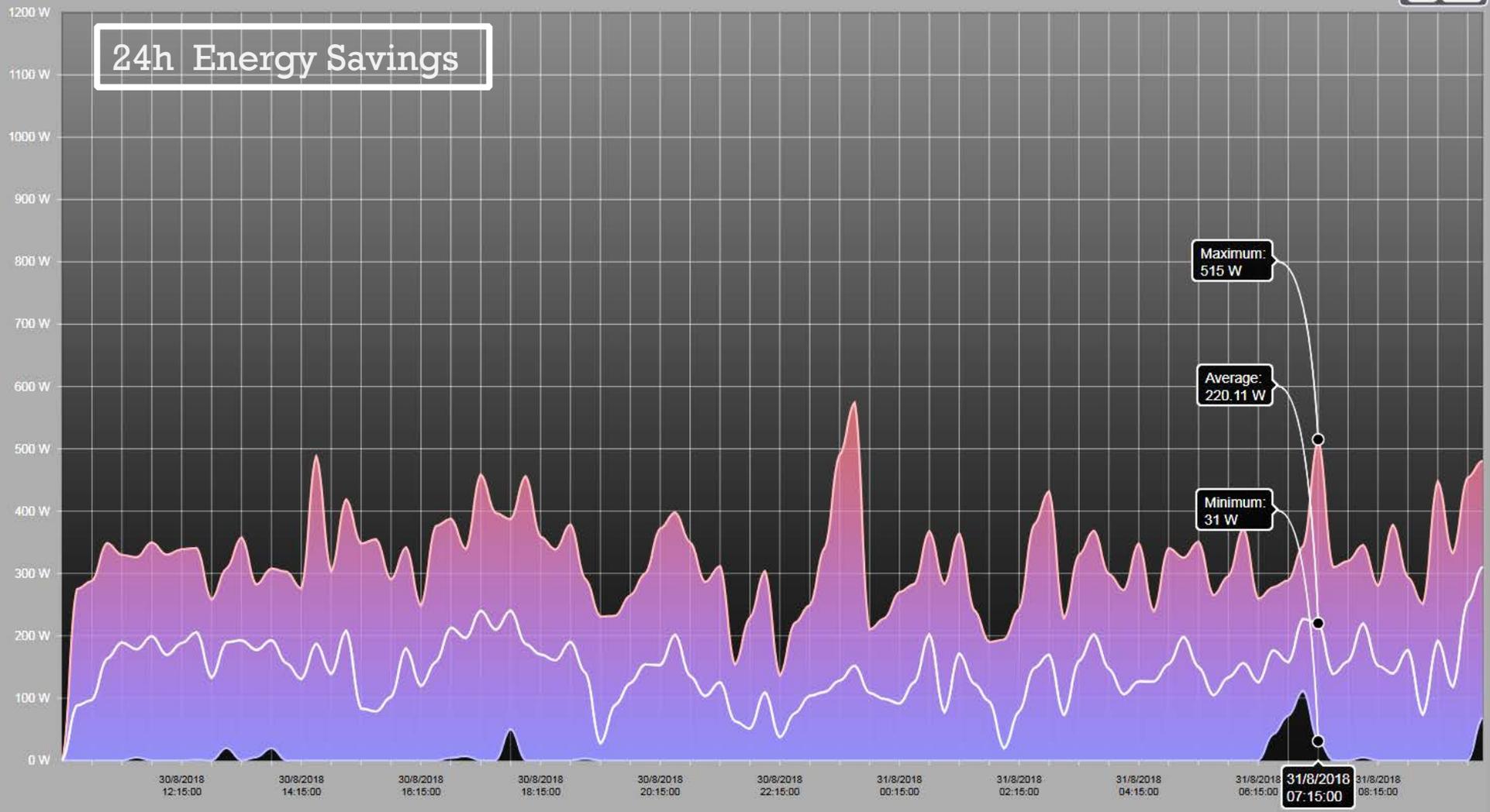
24h TPO Savings Only



24h TX Power Consumption



24h Energy Savings



- Transmitter
- Easy Config +
- Main/RF -
- Parameters
- SmartFM
- Presets
- Scheduler
- Synchro
- Maintenance +
- Modulation +
- Input Select +
- Input Sources +
- Audio Backup +

Configuration

Enable SmartFM

Status: Activated ●

Strategy:

- STANDARD
- SAVINGS
- SAVINGS SOFT
- BOOST
- LIMITED

Min 50 %
Max 100 %
Current 87 %

Credit Management

Lifetime Credits 740

Year Estimation 3895

Remaining Credits 8558

Remaining Days 802

[Add SmartFM Credits](#)

[Export Data](#)

Actual Benefits

Lifetime Savings 99 \$

1415 kWh

849 kg CO₂

Lifetime Boost 0 Wh

Potential Benefits / Year

Estimated Savings 522 \$

7450 kWh

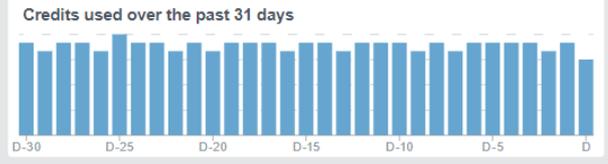
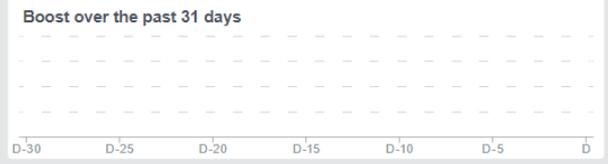
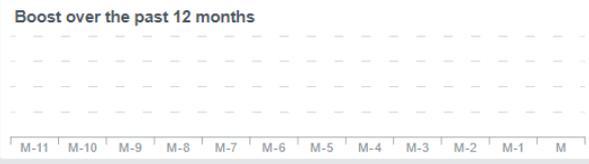
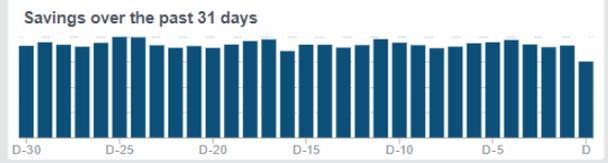
4470 kg CO₂

Estimated Boost -- Wh



SmartFM is a worldwide patented technology developed by WorldCast Systems

History



3 TESTING IN THE FIELD

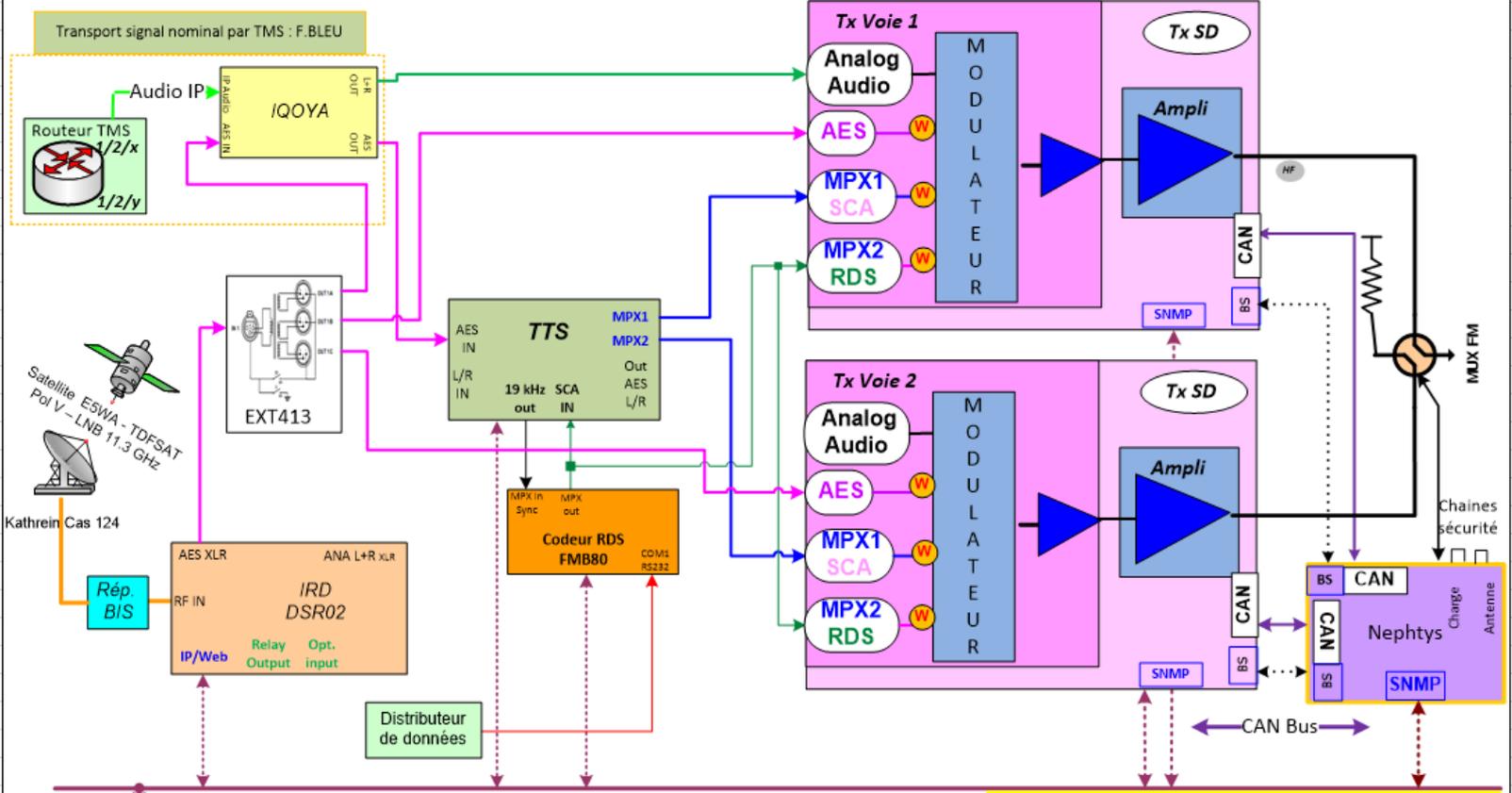
 Bassin d'Arcachon



Coller ici le synoptique

Configuration n°3S - 3

Conf8_MPX1-ST+RDS_Sec-AES_MPX2-RDS.conf



Transport signal nominal par TMS : F.BLEU

Audio IP

Routeur TMS 1/2/x

1/2/y

IQOYA

IP Audio - AES IN

L+R OUT

AES OUT

Satellite ESWA - TDFSAT

Poi V - LNB 11.3 GHZ

Kathrein Cas 124

EXT413

AES IN

L/R IN

19 kHz out

MPX1 IN

MPX2 IN

Out AES L/R

Rép. BIS

RF IN

AES XLR

ANA L+R XLR

IRD DSR02

Relay Output

Opt. input

IP/Web

TTS

AES IN

L/R IN

19 kHz out

MPX1 IN

MPX2 IN

Out AES L/R

Codeur RDS FMB80

MPX in Sync

MPX out

CD M1 RS232

Tx Voie 1

Analog Audio

AES

MPX1 SCA

MPX2 RDS

MODULATEUR

Ampli

Tx SD

CAN

BS

SNMP

Tx Voie 2

Analog Audio

AES

MPX1 SCA

MPX2 RDS

MODULATEUR

Ampli

Tx SD

CAN

BS

SNMP

Nephtys

Charge Antenne

CAN

BS

SNMP

Distributeur de données

1/ Raccordement SNMP Obligatoire sur chaque équipement

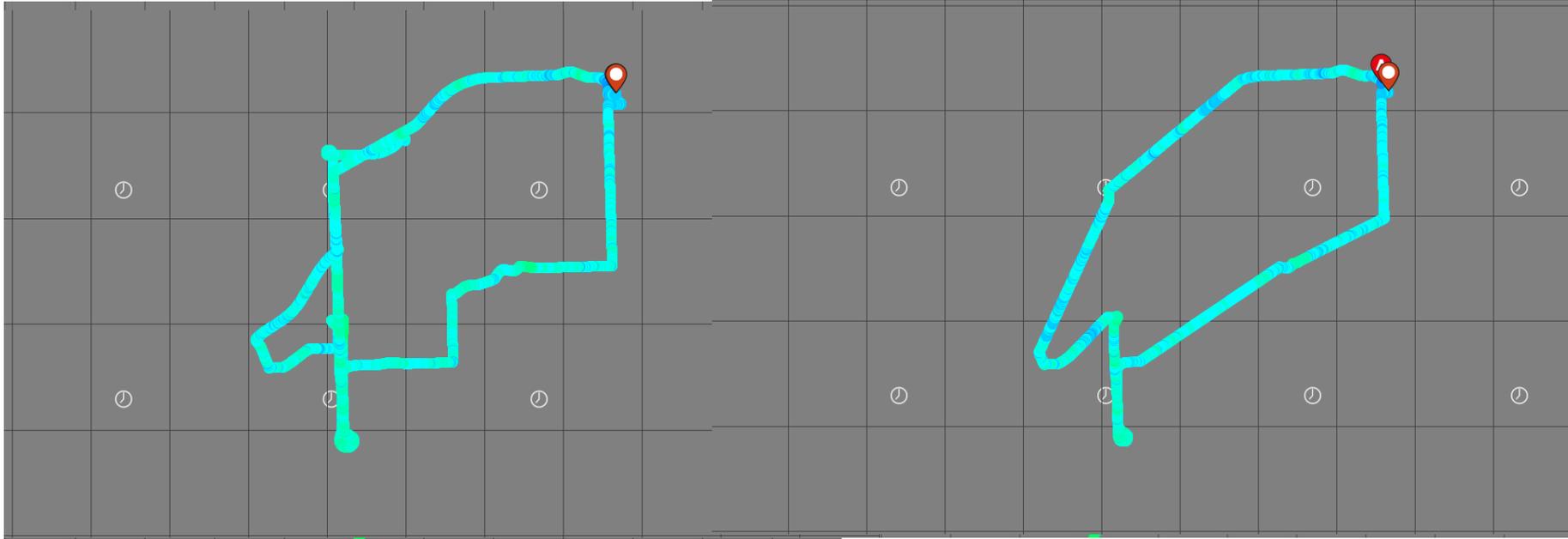
Les chaines de sécurités sont à câbler suivant les annexes sites

Subjective Results of double-blind drive tests

- “After various tests and analyses, at no time were we able to fault the system. When we found a qualitative degradation of the diffusion, it existed before the implementation of the algorithm. In the same way on the whole route and following the implementation of SMARTFM, at no time did we notice a decrease in the quality of the audio broadcast.”
- “We can therefore conclude that, in addition to the many advantages mentioned above, this new technology does not cause any degradation on the service area and is therefore uncompromising on the user experience.”

Same results in US drive tests

Absolute RF measurements with and without Smart FM on



No audible differences were noted

ENERGY SAVING ESTIMATION OVER 10 YEARS

- 10 x 1000W
- 0,16€/kWh
- +4%/year
- Old Tx: 63%
- New Tx: 72%
- SmartFM: - 30 400 kWh/year
- Program type: medium

NET BENEFIT		61 458 €
	SmartFM LICENSE	30 351 €
<i>License qty (to be indicated on your order)</i>		15800
Price for 1 year		2 528 €
Price for 3 years		7 891 €
	SAVED ELECTRICITY BILL	91 809 €
Old Tx		267 290 €
New ECRESO		233 879 €
New ECRESO with SmartFM		175 481 €
	CO ₂ EMISSIONS reduced by	286 757 kg
Old Tx		834 857 kg
New ECRESO		730 500 kg
New ECRESO with SmartFM		548 100 kg
		4,2 people
		-34%
	HEAT reduced by	2 955 W
Old Tx		5 873 W
New ECRESO		3 889 W
New ECRESO with SmartFM		2 918 W
		-50%
	CONSUMPTION reduced by	477 929 kWh
Old Tx		1 391 429 kWh
New ECRESO		1 217 500 kWh
New ECRESO with SmartFM		913 500 kWh
		-34%



ENERGY SAVING ESTIMATION

OVER 10 YEARS

- 10 x 10kW
- 0,20€/kWh
- +4%/year
- Old Tx: 72% (Gates Air)
- New Tx: 76% (Ecreso)
- SmartFM: - 304 000 kWh/year
- Program type: medium

NET BENEFIT		504 446 €
	SmartFM LICENSE	379 393 €
<i>License qty (to be indicated on your order)</i>		158000
Price for 1 year		31 600 €
Price for 3 years		98 643 €
	SAVED ELECTRICITY BILL	883 839 €
Old Tx		2 923 487 €
New ECRESO		2 769 619 €
New ECRESO with SmartFM		2 039 648 €
	CO ₂ EMISSIONS reduced by	2 208 474 kg
Old Tx		7 305 000 kg
New ECRESO		6 920 526 kg
New ECRESO with SmartFM		5 096 526 kg
		32,0 people
		-30%
	HEAT reduced by	15 633 W
Old Tx		38 889 W
New ECRESO		31 579 W
New ECRESO with SmartFM		23 256 W
		-40%
	CONSUMPTION reduced by	3 680 789 kWh
Old Tx		12 175 000 kWh
New ECRESO		11 534 211 kWh
New ECRESO with SmartFM		8 494 211 kWh
		-30%



4 GET SmartFM

ECRESO FM COMPATIBILITY

“SmartFM ready”

FM Transmitters

Ecreso FM 100W/300W

Ecreso FM 750W/1000W

Ecreso FM 1500W/2000W

Ecreso FM 3kW

Ecreso FM 5kW/10kW

Software upgrade

Free trial (~1 month)



SmartFM ecosystem

Field measurement

FM MC5 to measure SmartFM stations

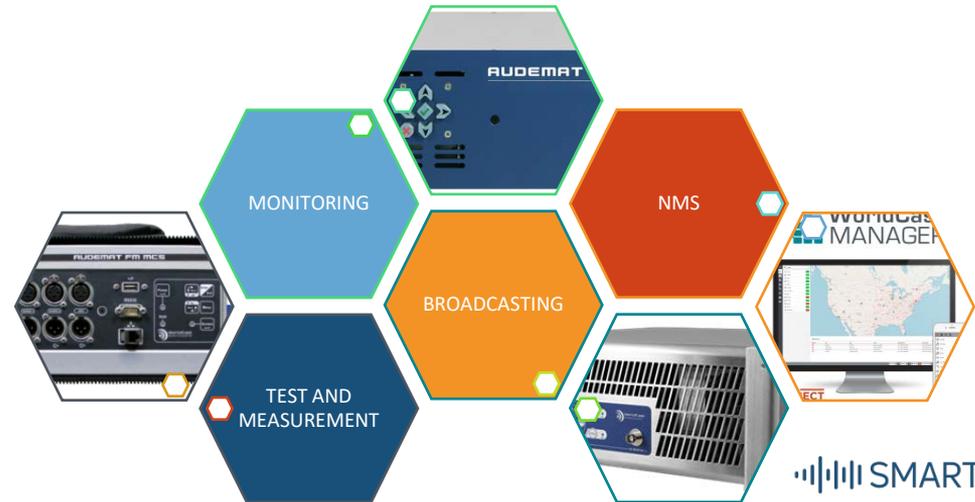
Signal Monitoring

Monitor more efficiently SmartFM stations.

Network Management Solutions

Ecreso License Manager

Worldcast manager compatibility





SMARTFM[®]

Artificial intelligence for radio



REDUCE ENERGY CONSUMPTION BY UP TO 40%*

- Reduces electrical consumption of your transmitter
- Reduces cooling costs up to 50%*
- Increases transmitter lifespan
- Reduces the maintenance



REDUCE CO2 EMISSIONS

- Measured and logged benefits
- Guaranteed return on investment.

FAQ – the “Big One”

Is SmartFM technology compatible FCC regulation ?

- Specifically, 47CFR part 73.1560(b):
 - “...must be maintained as near as practicable to the authorized transmitter output power and may **not** be less than 90% nor more than 105% of the authorized power.”

There is also paragraph (d):

“..becomes technically impossible... a broadcast **station** may operate at reduced power for... **not** more than 30 days ...exceed 10 consecutive days, notification must be made.

Currently Experimental or STA, possible rulemaking.

FAQ

Is SmartFM technology compatible with standard FM broadcast?

- Yes, SmartFM technology is fully compatible with analog FM broadcast; it can be integrated into your transmitter and does not require any receiver or on-site modification to deploy. However, what you do need is an Eceso FM Transmitter.

Did you perform tests on the field?

- Following several years of research, developments and analysis, SmartFM has been tested and measured over several months at real on-air stations.

- **Where can I find a transmitter with SmartFM technology?**
- SmartFM is a WorldCast Systems patent. Only Ecreso FM transmitters can include SmartFM.

How Do I upgrade my Ecreso FM transmitter to get SmartFM?

- Easy! All recent Ecreso FM transmitters* already on the field are SmartFM ready. Contact our technical support to get the latest software upgrade plus a free trial to observe SmartFM benefits in your specific broadcasting conditions.
- ** Verify your equipment compatibility.*

How to measure or monitor a SmartFM station?

- SmartFM being compatible with FM, common FM tools can be used; however for optimal analysis, WorldCast Systems provides a dedicated SmartFM ecosystem including FM transmitters, mobile measurement, monitoring and NMS software. For more information, ask us about our new SmartFM products and services.

Does SmartFM affect transmitter redundancy and reliability?

- No, ask us for a detailed presentation.

Does SmartFM affect transmitter lifespan?

- Yes, by increasing its lifespan! Ask us for a detailed presentation.

THANK YOU!

 Tony PETERLE

 t.peterle@worldcastsystems.com

 [linkedin.com/in/tony-peterle-cpbe](https://www.linkedin.com/in/tony-peterle-cpbe)

 +1 (305) 249-3110

www.worldcastsystems.com