

# Emerson Wireless SmartPower™ Solutions



- Intrinsically safe design enables routine maintenance in hazardous areas
- Predictable life specified under installed conditions
- Robust design for use in harsh environments
- Low level alerts for easy maintenance
- Keyed connection for easy and fail-safe replacement

# Emerson Wireless Solution

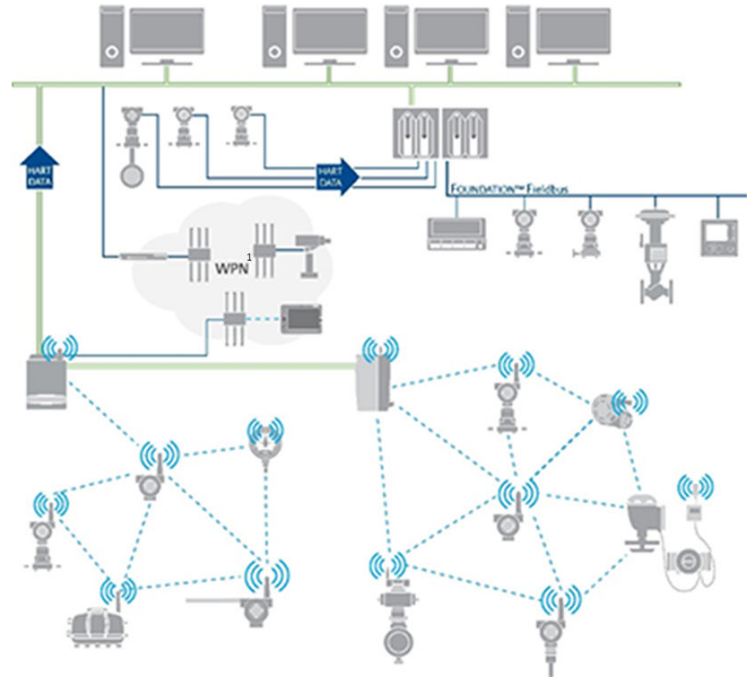
## IEC 62591 (*WirelessHART*<sup>®</sup>) ... the industry standard

### Self-organizing, adaptive mesh routing

- Backed by Emerson’s proven experience in Wireless field instrumentation and expert technical support.
- The self-organizing, self-healing network manages multiple communication paths for any given device. If an obstruction is introduced into the network, then data will continue to flow because the device has other established paths.

### Reliable wireless architecture

- Standard IEEE 802.15.4 radios
- 2.4 GHz Industrial, Scientific, and Medical (ISM) band sliced into 15 radio-channels
- Time-synchronized channel hopping
- Direct Sequence Spread Spectrum (DSSS) technology delivers high reliability in challenging radio environment



<sup>1</sup>Web Plant Network

### Emerson's Wireless

- Seamless integration to all existing host systems
- Native integration into DeltaV™ and Ovation™ is transparent and seamless
- Gateways interface with existing host systems using industry standard protocols including OPC, Modbus<sup>®</sup> TCP/IP, Modbus RTU, and EtherNet/IP™

### Layered security keeps your network safe

- Ensures data transmissions are received only by the Wireless Gateway.
- Network devices implement industry standard encryption, authentication, verification, anti-Jamming, and key management.
- Third party security verification including Achilles and FIPS197, with password strength monitoring, user-based login, password reset requirements, automatic lockout, and password expiration requirements.

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# SmartPower Solutions

## Black power module



**Designed for use with:**

- Rosemount 3051S Wireless Pressure Transmitter
- Rosemount 3051SMV Wireless Pressure Transmitter
- Rosemount 648 Wireless Temperature Transmitter
- Rosemount 848T Wireless Temperature Transmitter
- Rosemount 3308A Wireless Guided Wave Radar
- Rosemount 2160 Wireless Level Switch
- Rosemount 928 Wireless Gas Monitor
- Rosemount 702 Wireless Discrete Transmitter
- Rosemount 702 Wireless Plunger Arrival Transmitter
- Rosemount 705 Wireless Totalizing Transmitter
- Roxar CorrLog Wireless Corrosion Transmitter
- Roxar SandLog Wireless Sand/Erosion Transmitter
- Rosemount 4390 Series of Corrosion and Erosion Wireless Transmitter

## Green power module

**Designed for use with:**

Rosemount 708 Wireless Acoustic Transmitter  
Rosemount 3051 Wireless Pressure Transmitter  
Rosemount 2051 Wireless Pressure Transmitter  
Rosemount 248 Wireless Temperature Transmitter

## Alternate power options

**SmartPower Solutions Blue Power Module (see [Blue Power Module Product Data Sheet](#))**

- Recommended for energy intensive applications
- Double the lifetime, up to 10 years
- Compatible with most products using the Black Power Module
- Extended cover required
- Reference Blue Power Module datasheet for approved devices

**Energy harvesting options (see [Power Puck Product Data Sheet](#))**

- Perpetuum Intelligent Power Module (IPM) accepts harvested energy and delivers to transmitter
- Perpetua® Power Pucks convert heat into thermoelectric energy and send to IPM
- Compatible with most products using the Black Power Module
- Contact Emerson representative for approved devices

## Ordering Information

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See for more information on material selection.

### SmartPower Solutions Ordering Information

The starred offerings (★) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

### Model

Code	Description	
701P	SmartPower Options	

### SmartPower type

Code	Description	
BK	Black power module	★
GN	Green power module	★

### Certification

Code	Description	
KF <sup>(1)</sup>	FM, CSA, ATEX, IECEX, NEPSI, and INMETRO Intrinsically Safe	★

(1) *Markings on the Power Module may differ between manufacturing locations.*

# Emerson SmartPower Solutions Features

## **Intrinsically safe power solution**

- SmartPower Modules can be changed in hazardous areas
- No need to remove transmitter from process to change power module

## **Predictable life**

- Life expectancies specified under installed conditions
- Up to 10-year life depending on update rate

## **Easy maintenance**

- Low level alerts for easy planning of replacements
- Keyed connections for easy replacement and fail-safe connection

## **Safe robust design**

- Short circuit protection
- No special training required
- Designed for harsh environments

# Specifications

## Functional specifications

### Life expectancy

Up to 10-year life at one minute update rate. See [Power module life](#) for more information.

### Humidity limits

0–100 percent relative humidity

## Physical specifications

### Material selection

Emerson provides a variety of Rosemount product with various product options and configurations including materials of construction that can be expected to perform well in a wide range of applications. The Rosemount product information presented is intended as a guide for the purchaser to make an appropriate selection for the application. It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product, materials, options, and components for the particular application. Emerson is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product, options, configuration or materials of construction selected.

### Electrical connections

Emerson SmartPower solutions were designed for use with various Emerson Wireless devices, listed on .

### Rated voltage

Black Power Module: 7.2 V Green Power Module: 3.6 V

### Materials of construction

Primary Lithium-thionyl chloride with a polybutylene terephthalate (PBT) enclosure.

### Weight

Black Power Module -0.50 lb (230 g) Green Power Module - 0.34 lb (155 g)

## Performance specifications

### Electromagnetic compatibility (EMC)

All models:

Meets all relevant requirements of EN 61326-1; 2006; EN 61326-2-3; 2006.

### Vibration effect

No effect when tested per the requirements of IEC60770-1: High Vibration Level - field or pipeline (10–60 Hz 0.21 mm displacement peak amplitude/60–2000 Hz 3g).

**Temperature limits**

Operating limit	Storage limit
-40 to 185 °F	-40 to 185 °F
-40 to 85 °C	-40 to 85 °C

**Power module life**

Power module life in a given wireless transmitter is mainly a function of the wireless update rate. Faster wireless updates lead to lower power module life. Power module life is also impacted by extreme temperature service and wireless network conditions. Power module storage conditions should be temperature controlled.

**Table 1: Power Module Life Estimates**

Power Module Life Estimates in Years									
Update	1 sec	2 sec	4 sec	16 sec	60 sec	300 sec	20 min	40 min	60 min
<b>Black Power Module</b>									
3051S	0.6	1.3	2.2	5.8	10.0	10.0	10.0	10.0	10.0
3051SMV	0.4	0.7	1.3	3.5	6.8	9.4	10.0	10.0	10.0
648	0.9	0.7	2.8	6.9	10.0	10.0	10.0	10.0	10.0
848T	NR	NR	0.7	2.4	6.3	10.0	10.0	10.0	10.0
3308A	NR	NR	1.5	4.7	10.0	10.0	10.0	10.0	10.0
2160	1.2	2.1	3.2	6.9	10.0	10.0	10.0	10.0	10.0
928	1.5	2.1	2.9	3.0	3.2	3.2	3.2	3.2	3.2
702 Discrete	1.5	2.7	4.1	8.8	10.0	10.0	10.0	10.0	10.0
702 Plunger	0.7	0.9	1.1	1.2	1.2	1.2	1.2	1.2	1.2
705	1.5	2.7	4.1	8.8	10.0	10.0	10.0	10.0	10.0
CorrLog	NR	NR	NR	NR	NR	NR	1.6	2.6	3.7
SandLog	NR	NR	NR	NR	NR	NR	1.6	2.6	3.7
CSI 9420	Not recommended for Black Power Module. See product documentation for Blue Power Module.								
<b>Green Power Module</b>									
708	1.2	2.3	3.8	8.4	10.0	10.0	10.0	10.0	10.0
3051	0.6	1.3	2.2	5.8	10.0	10.0	10.0	10.0	10.0
2051	0.6	1.3	2.2	5.8	10.0	10.0	10.0	10.0	10.0
248	0.9	1.7	2.8	6.9	10.0	10.0	10.0	10.0	10.0

To better estimate power module life for a wireless transmitter in your network, visit the on-line [power module life estimator](#).

**Assumptions**

- Three network descendants
- 70 °F ambient temperature
- 10 years is shelf life of lithium cell
- ±10% capacity for temperature and network variation



**Note**

NR: this update rate not recommended for this product

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# Product Certifications – 701P SmartPower Solutions

Rev 4.4

## European Directive Information

A copy of the EC Declaration of Conformity can be found at the end of the Quick Start Guide. The most recent revision of the EC Declaration of Conformity can be found at [Emerson.com/Rosemount](https://www.emerson.com/Rosemount).

## Ordinary Location Certification for FM Approvals

As standard, the transmitter has been examined and tested to determine that the design meets the basic electrical, mechanical, and fire protection requirements by FM Approvals, a nationally recognized test laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

## Installing in North America

The US National Electrical Code® (NEC) and the Canadian Electrical Code (CEC) permit the use of Division marked equipment in Zones and Zone marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

### USA

#### KF USA Intrinsically Safe (IS)

<b>Certificate:</b>	3042016
<b>Standards:</b>	FM Class 3600 – 1998, FM Class 3610 – 2010, FM Class 3810 – 2005
<b>Markings:</b>	IS CL I, DIV 1, GP A, B, C, D; CL II, DIV 1, GP E, F, G; Class III; Class 1, Zone 0 AEx ia IIC T4; T4 (-40 °C ≤ T <sub>a</sub> ≤ +70 °C) (See <a href="#">Table 2</a> or <a href="#">Table 3</a> for parameters)

#### Special Condition for Safe Use (X):

Replacement of power module, see instructions for final product.

### Canada

#### KF Canada Intrinsically Safe

<b>Certificate:</b>	2430393
<b>Standards:</b>	CAN/CSA C22.2 No. 0-M91, CSA Std C22.2 No. 157-92
<b>Markings:</b>	Intrinsically Safe Class I, Division 1, Groups A, B, C, and D T3C (T <sub>a</sub> ≤ +70 °C) Warning – refer to QIG 825-0100-4701 for Safe I.S. (See <a href="#">Table 2</a> or <a href="#">Table 3</a> for parameters)

**Special Condition for Safe Use (X):**

The power modules are certified as components for use in intrinsically safe products where the suitability/combination of use in the final assembly shall be subjected to CSA acceptance. The final assembly must incorporate all protection features necessary for batteries in accordance with applicable standards of the final intrinsically safe application.

**Europe****KF ATEX Intrinsic Safety**

**Certificate:** Baseefa11ATEX0042X

**Standards:** EN 60079-0: 2018, EN 60079-11: 2012

**Markings:**



II 1 G Ex ia IIC T4 Ga, T4(-55 °C ≤ T<sub>a</sub> ≤ +70 °C)



II 1 G Ex ia IIC T5 Ga, T5(-55 °C ≤ T<sub>a</sub> ≤ +40 °C)

(See [Table 2](#) or [Table 3](#) for parameters)

**Special Condition for Safe Use (X):**

The plastic enclosure of the Model 701P SmartPower Power Modules may constitute a potential electrostatic ignition risk and caution should be used when being handled.

**Note**

This condition of use does not apply after a Power Module is installed within a wireless transmitter enclosure.

**International****KF IECEx Intrinsic Safety**

**Certificate:** IECEx BAS 11.0026X

**Standards:** IEC 60079-0: 2011, IEC 60079-11: 2011

**Markings:** Ex ia IIC T4/T5 Ga, T4 (-55 °C ≤ T<sub>a</sub> ≤ +70 °C), T5 (-55 °C ≤ T<sub>a</sub> ≤ +40 °C)

**Special Condition for Safe Use (X):**

The plastic enclosure of the Model 701P SmartPower Power Modules may constitute a potential electrostatic ignition risk and caution should be used when being handled.

**Note**

This condition of use does not apply after a Power Module is installed within a wireless transmitter enclosure.

**Brazil****KF Brazil Intrinsic Safety**

**Certificate:** UL-BR 14.0123X

**Standards:** ABNT NBR IEC 60079-0:2008 + Errata 1:2011, ABNT NBR IEC 60079-11:2009

**Markings:** Ex ia IIC T4/T5 Ga X  
T4 (-55 °C ≤ T<sub>a</sub> ≤ +70 °C)  
T5 (-55 °C ≤ T<sub>a</sub> ≤ +40 °C)

China

KF China 本质安全

证书 GYJ20.1357X (CCC 认证)  
 所用标准 GB3836.1 - 2010, GB3836.4 - 2010, GB3836.20-2010  
 标志 Ex ia IIC T4/T5 Ga

特殊使用条件(X):

电池外壳为非金属材质, 可能产生静电危险, 只能用湿布擦拭。

使用注意事项:

1. 产品使用环境温度为: 温度组别产品使用环境温度
  - a. T4 -60 °C ≤ T<sub>a</sub> ≤ +70 °C
  - b. T5 -60 °C ≤ T<sub>a</sub> ≤ +40 °C

2.

电池类型	最高输出电压 U <sub>o</sub> (V)	最大输出电流 I <sub>o</sub> (A)	最大输出功率 P <sub>o</sub> (W)	最大外部等效参数	
				Co(μF)	Lo(μH)
BK	7.8	2.16	0.83	3.0	9.4

电池类型	最高输出电压 U <sub>o</sub> (V)	最大输出电流 I <sub>o</sub> (A)	最大输出功率 P <sub>o</sub> (W)	最大外部等效参数	
				Co(μF)	Lo(μH)
GN	3.9	2.78	2.71	100	4.6

3. 用户不得自行更换该产品的零部件, 应会同产品制造商共同解决运行中出现的故障, 以杜绝损坏现象的发生。
4. 产品的安装、使用和维护应同时遵守产品使用说明书、GB3836.13-2013“爆炸性环境 第 13 部分: 设备的修理、检修、修复和改造”、GB/T3836.15-2017“爆炸性环境 第 15 部分: 电气装置的设计、选型和安装”、GB/T3836.16-2017“爆炸性环境 第 16 部分: 电气装置的检查与维护”、GB/T 3836.18-2017“爆炸性环境 第 18 部分: 本质安全电气系统”、GB50257-2014“电气装置安装工程 爆炸和火灾危险环境电力装置施工及验收规范”的有关规定。

Table 2: 701PBK

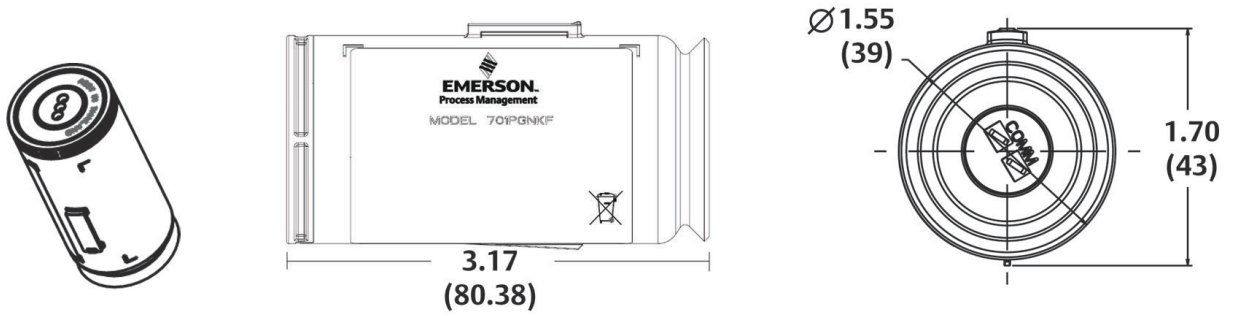
U <sub>o</sub>	7.8V
I <sub>o</sub>	2.16A
P <sub>o</sub>	0.83W
C <sub>o</sub>	3.0μF
L <sub>o</sub>	7.6μH

Table 3: 701PGN

U <sub>o</sub>	3.9V
I <sub>o</sub>	2.78A
P <sub>o</sub>	2.71W
C <sub>o</sub>	100μF
L <sub>o</sub>	4.6μH

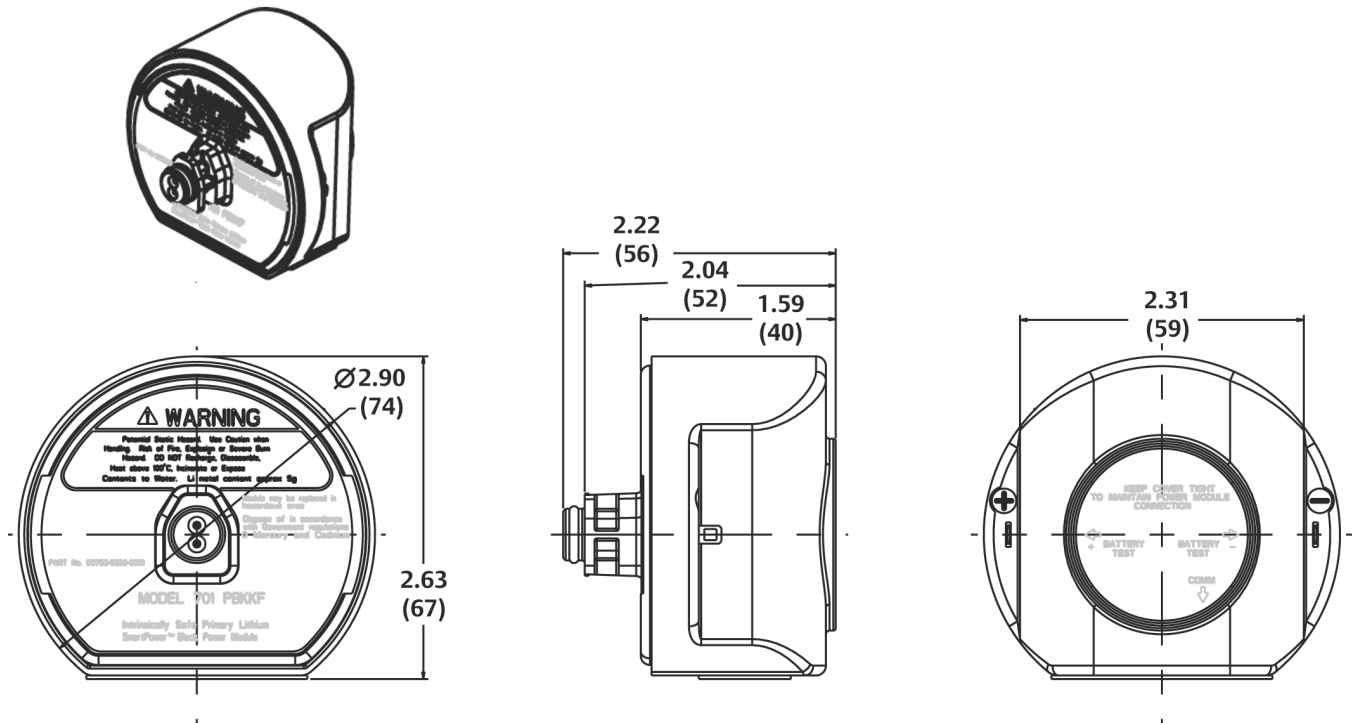
# Dimensional Drawings

Figure 1: 701PGN Green Power Module



Dimensions are in inches (millimeters).

Figure 2: 701PBK Black Power Module



Dimensions are in inches (millimeters).





For more information: [Emerson.com](https://www.emerson.com)

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