

SmartPower Solutions



WirelessHART® CE

- Intrinsically Safe design enables ability to perform 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

IEC 62591 (WirelessHART™)... the industry standard

Self-Organizing, Adaptive Mesh Routing

- No wireless expertise required, devices automatically find the best communication paths
- Network continuously monitors paths for degradation and repairs itself
- Adaptive behavior provides reliable, hands-off operation and simplifies network deployments, expansion, and reconfiguration
- Supports both star and mesh topologies

Industry Standard Radio with Channel Hopping

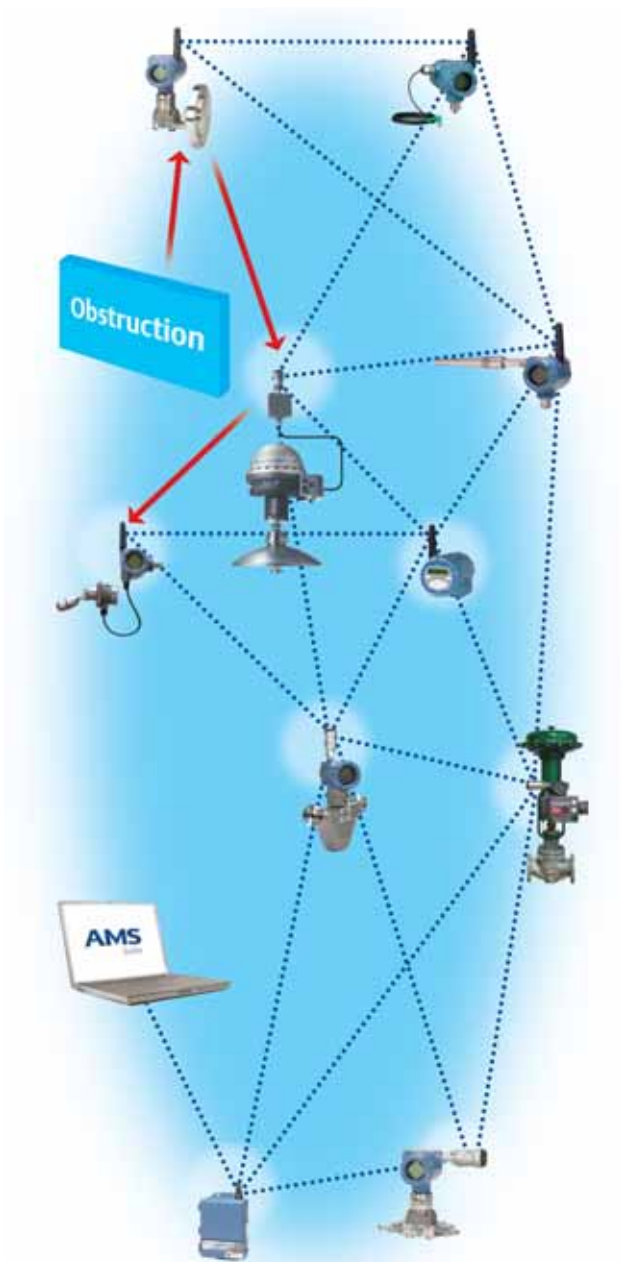
- Standard IEEE 802.15.4 radios
- 2.4 GHz ISM band sliced into 16 radio-channels
- Continually “hop” across channels to avoid interference and increase reliability
- Direct Sequence Spread Spectrum (DSSS) technology delivers high reliability in challenging radio environment

Self-Healing Network

- The self-organizing, self-healing network manages multiple communication paths for any given device. If an obstruction is introduced into the network, data will continue to flow because the device already has other established paths. The network will then lay in more communication paths as needed for that device.

Seamless Integration to Existing Hosts

- Transparent and seamless integration
- Same control system applications
- Gateways connect using industry protocols



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SmartPower solutions



Black Power Module

- Hazardous Area Certifications: FM, CSA, ATEX, IECEx
- Designed for use with:
 - Rosemount 702 Wireless Discrete Transmitter
 - Rosemount 3051S Wireless Pressure Transmitter
 - Rosemount 648 Wireless Temperature Transmitter
 - Rosemount 848T Wireless temperature Transmitter
 - Rosemount 248 Wireless Temperature Transmitter
 - CSI 9420 Wireless Vibration Transmitter
 - Rosemount Analytical 6081 Wireless Transmitter for pH and Conductivity
 - Rosemount 2160 Wireless Vibrating Fork Liquid Level Switch
 - Rosemount 3308 Wireless Guided Wave Radar Level and Interface Transmitter



Green Power Module

- Hazardous Area Certifications: FM, CSA, ATEX, IECEx
- Designed for use with:
 - Rosemount 708 Wireless Acoustic Transmitter
 - Rosemount 3051 Wireless Pressure Transmitter
 - Rosemount 2051 Wireless Pressure Transmitter

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

Ordering information

Table 1. SmartPower Solutions Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery.

The Expanded offering is subject to additional delivery lead time.

Model	Product Description	
701P	SmartPower Options	
SmartPower Type		
Standard		Standard
BK	Black Power Module	★
GN	Green Power Module	★
Certification		
Standard		Standard
KF	FM, CSA, ATEX, and IECEx Intrinsically Safe	★
Typical Model Number: 701PBKKF		

Specifications

Functional specifications

Life expectancy

Up to 10 year life at 1 minute update rate. See [Table on page Wireless-5](#) for more information.

Humidity limits

0–100% relative humidity

Physical specifications

Electrical connections

Emerson SmartPower solutions were designed for use with various Smart Wireless devices.

The black power module is used with the 3051S, 648, 848, 702, 2160, 9420, and 6081.

The green power module is used with the 708, 3051C, and 2051.

Rated voltage

Black Power Module: 7.2 V

Green Power Module: 3.6 V

Materials of construction

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.

Table 2. Power Module life estimates

Power Module Life Estimates in Years							
Update	4 sec	16 sec	60 sec	300 sec	20 min	40 min	60 min
3051S	2.2	5.8	10.0	10.0	10.0	10.0	10.0
3051	2.2	5.8	10.0	10.0	10.0	10.0	10.0
2051	2.2	5.8	10.0	10.0	10.0	10.0	10.0
648	2.8	6.9	10.0	10.0	10.0	10.0	10.0
848	0.7	2.4	6.3	10.0	10.0	10.0	10.0
248	2.8	6.9	10.0	10.0	10.0	10.0	10.0
702	4.1	8.8	10.0	10.0	10.0	10.0	10.0
2160	2.0	6.0	10.0	10.0	10.0	10.0	10.0
708	3.8	8.4	10.0	10.0	10.0	10.0	10.0
6081 pH	1.8	3.3	6.0	10.0	10.0	10.0	10.0
6081 C	1.6	2.5	4.0	8.0	10.0	10.0	10.0
4310/20 Std	4.0	7.2	9.0	10.0	10.0	10.0	10.0
4310/20 Ext	8.4	10.0	10.0	10.0	10.0	10.0	10.0
9420	NR	NR	NR	NR	3.0	5.2	7.0

Notes

Assumptions:

3 Network Descendants

70 °F Ambient Temperature

10 years is shelf life of lithium cell

+/- 10% capacity for temperature and network variation

NR: this update rate not recommended for this product

To better estimate power module life for a wireless transmitter in your network visit

<http://www2.emersonprocess.com/en-US/brands/rosemount/Wireless/SmartPower-Solutions/Pages/index.aspx>

for an on-line power module life Estimator.

Product certifications

Approved manufacturing locations

Rosemount Inc. – Chanhassen, Minnesota, USA
 Emerson Process Management GmbH & Co. OHG - Wessling, Germany
 Beijing Rosemount Far East Instrument Co., Limited - Beijing, China
 Emerson Process Management Asia Pacific Private Limited – Singapore

European directive information

The EC declaration of conformity can be found on page 10 of the SmartPower Solutions QIG (doc. number 00825-0100-4701). The most recent revision of the DoC can be found at www.rosemount.com.

Ordinary Location Certification for FM approvals

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

Hazardous locations certificates

North American certifications

KF FM Approvals Intrinsically Safe
 Certificate No: 3042016
 Applicable Standards: Class 3600:1998, Class 3610:2010, Class 3810:2005
 Markings: IS CL I, II, III, Div. 1, GP A, B, C, D, E, F, G
 IS CL I, Zone 0, AEx ia IIC T4 (-40 °C ≤ T_a ≤ 70 °C)
 (See [Table 3](#) or [Table 4](#) for parameters)
Specific conditions for Safe Use:
 Replacement of power module, see instructions for the final product.

KF CSA International Intrinsically Safe
 Certificate No: 2430393
 Applicable Standards: CSA Std. C22.2 No. 0-M91, CSA Std. C22.2 No.157-92
 Markings: Intrinsically Safe CL I, GP A, B, C, D; Temp Code T3C (T_a ≤ 70 °C) Warning –refer to QIG 825-0100-4701 for Safe I.S. Use
 (See [Table 3](#) or [Table 4](#) for parameters)
Specific conditions for Safe I.S. Use:
 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.

European certifications

KF ATEX Intrinsic Safety
 Certificate No.: Baseefa11ATEX0042X
 Applicable Standards: EN 60079-0:2009, EN 60079-11:2007
 Markings: ATEX Category II 1G
 Ex ia IIC T4 Ga (-55 °C ≤ T_a ≤ +70 °C)
 T5 Ga (-55 °C ≤ T_a ≤ +40 °C)
 (For Output Parameters see [Table 3](#) and [Table 4](#).)
Special conditions for safe use (X):
 The plastic enclosures of the Model 701P SmartPower Power Modules may constitute a potential electrostatic ignition risk and caution should be used when being handled.
 (This condition of use does not apply after a Power Module is installed within a wireless transmitter enclosure.)

Other world area certifications

KF IECEx Intrinsic Safety
 Certificate Number: IECEx BAS 11.0026X
 Applicable Standards: IEC 60079-0:2004, IEC 60079-0:2007-10, IEC 60079-11:2006
 Markings: Ex ia IIC T4 Ga (-55 °C ≤ T_a ≤ +70 °C)
 T5 Ga (-55 °C ≤ T_a ≤ +40 °C)
 (For Output Parameters see [Table 3](#) and [Table 4](#).)
Special Conditions for Safe Use (X)
 The plastic enclosures of the Model 701P SmartPower Power Modules may constitute a potential electrostatic ignition risk and caution should be used when being handled.
 (This condition of use does not apply after a Power Module is installed within a wireless transmitter enclosure.)

Safety parameters

The following safety parameters apply to all of the hazardous locations certificates.

Table 3. Safety Parameters

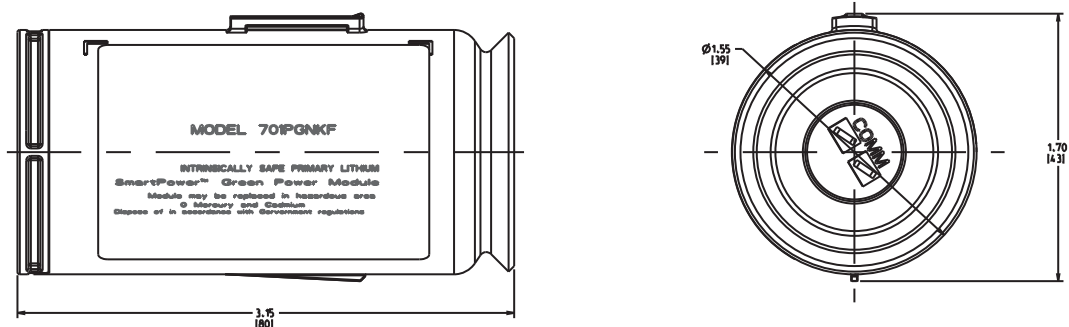
701PBKKF Black Power Module	
$U_o = 7.8 \text{ V}$	
$I_o = 2.16 \text{ A}$	
$P_o = 0.83 \text{ W}$	
$C_o = 3.0 \text{ }\mu\text{F}$	
$L_o = 7.6 \text{ }\mu\text{H}$	

Table 4. Safety Parameters

701PGNKF Green Power Module	
$U_o = 3.9 \text{ V}$	
$I_o = 2.78 \text{ A}$	
$P_o = 2.71 \text{ W}$	
$C_o = 100 \text{ }\mu\text{F}$	
$L_o = 4.6 \text{ }\mu\text{H}$	

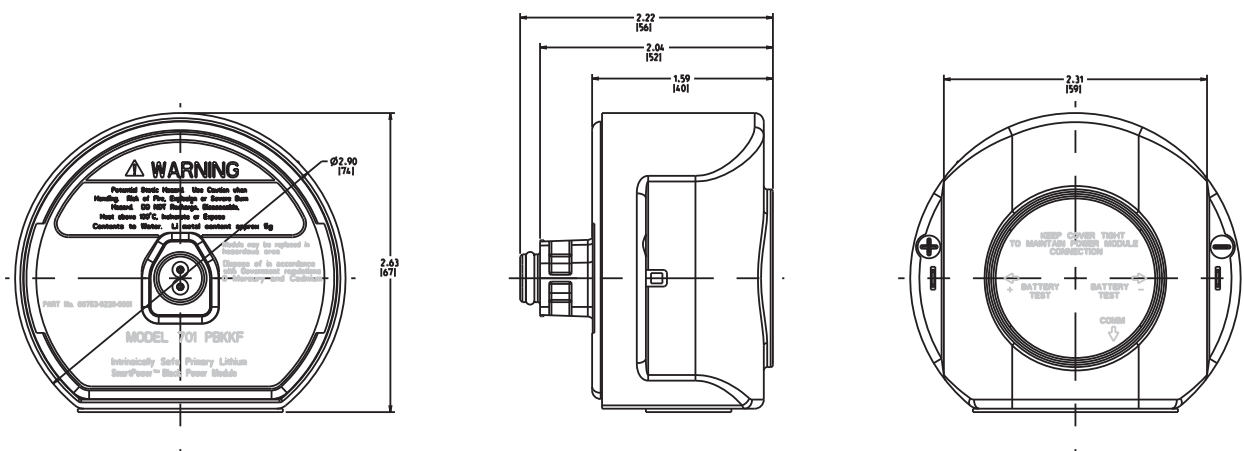
Dimensional drawings

701PGN Green Power Module



Dimensions are in inches (millimeters)

701PBK Black Power Module



Dimensions are in inches (millimeters)

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