



BS&B WIRELESS, L.L.C.

SmartSystem™ Selection Guide



*U.S. patent 6,598,454 and
other U.S. and international patents pending.*

**The flexible wireless platform
for instrumentation communication
and monitoring.**

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The Flexible Wireless Platform for Cost

Field Mounted Transmitter Options

Model ⁸	Function	Electrical Power ¹	Frequency ²	Service Range ³	Temperature Range	System Ratio ⁴
DTM09	Simple switch transmitter	Battery or External 5~32 VDC	902~928 MHz	~ 1/2 mile (~ 800 meters)	-40°F/185°F -40°C/85°C	Up to 32
ATM09	Analog sensor transmitter	Battery or External 5~32 VDC	902~928 MHz	~ 1/2 mile (~ 800 meters)	-40°F/185°F -40°C/85°C	Up to 32
RPT09	Repeater ⁷	External 5~32 VDC	902~928 MHz	~ 1/2 mile (~ 800 meters)	-40°F/185°F -40°C/85°C	N/A
DTM24	Simple switch transmitter	Battery or External 5~32 VDC	2.4 GHz	~ 1/3 mile (~ 500 meters)	-40°F/185°F -40°C/85°C	Up to 32
ATM24	Analog sensor transmitter	Battery or External 5~32 VDC	2.4 GHz	~ 1/3 mile (~ 500 meters)	-40°F/185°F -40°C/85°C	Up to 32
RPT24	Repeater ⁷	External 5~32 VDC	2.4 GHz	~ 1/3 mile (~ 500 meters)	-40°F/185°F -40°C/85°C	N/A

Notes:

1. Long life Lithium batteries are used that will give several years of DTM service under normal use with the two minute default heartbeat interval. When transmitters are programmed to send information more frequently, battery life will be reduced and external DC power should be considered as the power supply.
2. Frequency choices are available; 902~ 928 MHz or 2.4GHz. The frequency choice depends greatly upon the country of operation of the equipment. In North America either frequency

is available for unlicensed user operation; 902~ 928 MHz is typically recommended. In most other countries, 2. 4 GHz must be used for unlicensed operation.

3. Transmitters are designed to operate up to 1mi/1.6 km “line of sight.” In typical industrial environments, the range indicated in the table applies when using standard antenna. Longer range service is available with special antenna options, using a repeater (RPT) or by careful planning of component locations. Applications can be validated using the Site Survey Kit before

Receiver Options

Model ²	Function	Electrical Power ¹	Frequency ³	System Ratio ⁴	Temperature Range	Class 1, Div. 2 ⁵
DRM09	Receiver	External DC 8~32 V	902~928 MHz	1 to 32	-40°F/185°F -40°C/85°C	Yes
DMM09	Receiver and Monitor	External DC 8~32 V	902~928 MHz	1 to 32	-4°F/140°F -20°C/60°C	RTM unit only
DM409	Receiver and Monitor	External DC 8~32 V	902~928 MHz	1 to 4	-4°F/140°F -20°C/60°C	RTM unit only
DRM24	Receiver	External DC 8~32 V	2.4 GHz	1 to 32	-40°F/185°F -40°C/85°C	Yes
DMM24	Receiver and Monitor	External DC 8~32 V	2.4 GHz	1 to 32	-4°F/140°F -20°C/60°C	RTM unit only
DM424	Receiver and Monitor	External DC 8~32 V	2.4 GHz	1 to 4	-4°F/140°F -20°C/60°C	RTM unit only

Notes:

1. All Receiver units require external DC power.
2. All Receiver units comprise two enclosures. In addition to the main processor DRM, DMM or DM4 enclosure, each receiver also has an RTM unit. The RTM houses the radio used to collect and acknowledge system information exchanges. Depending upon the radio frequency employed, this radio module will be designated RTM 09 or RTM 24. RTM units are DC powered through the cable connecting the RTM to the DRM, DMM or DM4 enclosure.
3. Frequency choices are available; 902~ 928 MHz or 2.4GHz. The frequency choice depends greatly upon the country of operation

of the equipment. In North America either frequency is available for unlicensed operation; 902~ 928 MHz is typically recommended. In most other countries, 2.4 GHz must be used for unlicensed operation. All components within an installation must operate on the same frequency.

4. “System Ratio” indicates the quantity of transmitters that can be assigned to a single receiver unit. Any combination of DTM and ATM devices may be used. Repeater units are not part of the System Ratio count.
5. The receiver antenna is contained in the RTM module which is suitable for Class 1 Division 2, Group B/C/D service when

Effective Communication & Monitoring*

*Patent Pending

Sensor Cable Max Length ⁵	Heartbeat Default Interval	Transmission Retry	Programmable Update Period ⁹	Class 1 Div. 2 ⁶
100 feet (30 meters)	2 minutes	Yes	From 1 minute to 255 minutes	Yes
100 feet (30 meters)	2 minutes	Yes	From 5 seconds to 255 seconds	Yes
N/A	N/A	N/A	N/A	Yes
100 feet (30 meters)	2 minutes	Yes	From 1 minute to 255 minutes	Yes
100 feet (30 meters)	2 minutes	Yes	From 5 seconds to 255 seconds	Yes
N/A	N/A	N/A	N/A	Yes

investment in equipment; please contact BS& B or your local representative for details. Local RF conditions can cause service range variation. True “line of sight” installation is not required for reliable application of the system.

4. “System Ratio” indicates the quantity of transmitters that can be assigned to a single receiver unit. Any combination of DTM and ATM devices may be used. Repeater units are not part of the System Ratio count.

5. The shortest cable length between sensor and DTM or ATM

should be used. Always use shielded cable.

6. When ordered for Class 1, Division 2, Group B/C/D service, external power and sensor connection must meet local jurisdiction requirements. Connections shall be supplied by BS&B. The quantity and type of connections must be identified at the time of order.

7. One repeater may be used to add service range.

8. Standard power and sensor connection options are conduit or gland seal; specify at the time of order. The DTM sensor may also use a quick connect option.

Modbus Status ⁶	Relay Outputs ⁷	LCD Screen	LEDs	SSI Display ⁸
Slave	2	No	0	No
Slave	2	Yes	3	Yes
Slave	2	Yes	3	Yes
Slave	2	No	0	No
Slave	2	Yes	3	Yes
Slave	2	Yes	3	Yes

attached to a DRM, DMM or DM4 by conduit. The RTM module can be up to 50 feet from the DRM, DMM or DM4; shielded cable or cable in flexible conduit is supplied. When ordered for Class 1, Division 2, Group B/C/D service, flexible conduit and connectors are supplied by BS&B. Requirements for external power, RS232/RS485 and relay connection options must be identified at time of order.

6. Each DRM, DMM and DM4 is a Modbus “slave” module that can be polled by a Modbus master to communicate system information via an RS232/RS485 link. This link shall be in appropriate conduit for Class 1, Division 2 applications (supplied by user).

Conduit connections must be prepared and supplied by BS&B.

7. Each DRM, DM4 and DMM has 2 relay outputs that can be programmed to enable external local annunciation of events.

8. The DMM includes indication of Radio Signal Strength (SSI) for each sensor channel. This can be used to support the addition of sensors to an existing system by placing the chosen transmitter where the highest SSI value is achieved. This feature can also be used as a quick check of RF quality in the event that a ‘loss of communication’ alarm is received for a particular transmitter.

9. Standard connection options are conduit or gland seal; ensure the correct option is selected at the time of order.

Relief Device Manager - Emissions Monitoring for Pressure Relief Devices

Introduction

BS&B Relief Device Manager provides a wireless monitoring system that can be triggered by any switch or analog sensor. Developed initially for use with Rupture Disk Burst Alert® Sensors, the system is now designed to accept the following types of input signal;

- Simple switch change of state (NC to NO or NO to NC)
- 4~20mA analog (two-wire or four-wire)
- 0~5 Volt analog (two-wire)

By accepting information from practically any sensing device, the user has complete flexibility regarding the method used to detect the operation or leakage of pressure relief devices.

Typical emissions monitoring applications of Relief Device Manager include the following detection methods:

Simple Switch

By detecting the lift and reseal of the pressure relief device, an alarm can be generated and the time of device operation accurately captured. Knowing the flow capacity of the pressure relief device, calculation of the amount of fluid released can be made.

Leak Detector Alert Sensor *(see BS&B catalog 77-1010)*

By sealing the outlet to a pressure relief device with a leak detector sensor, the accumulation of light overpressure in the outlet of, for example, a leaking relief valve, leads to the early and reliable notification of such leakage allowing prompt remedial action.

Pressure Switch

By detecting the presence or absence of a predetermined pressure at the outlet of a pressure relief device, its operation is signaled. Upon reseating of the pressure relief device, a non latching pressure switch can identify its re-closing as well. Knowledge of opening and re-closing times can be used to calculate the amount of fluid released.



DTM field transmitter

Vibration Sensor

By listening for relief device vibration signature frequency and intensity, the operation or leakage of pressure relief devices can be detected.



DMM

Shown with mounting bracket and optional gland seals in place.

Pressure & Temperature Sensors

By measuring the pressure at the inlet and outlet of a pressure relief device as well as the inlet temperature, established formulae can be used together with process data to determine the amount of fluid released during the operation of the pressure relief device (*patent pending*).

SmartSystem: The Flexible Wireless Platform

How do you select the right wireless system with so many choices? Many wireless systems have combined sensors and transmitters. SmartSystem is designed to allow the user to invest in a single *Flexible Wireless Platform* that can be used with any preferred sensor or switch.

Today the system may be used for Pressure Relief Valve Monitoring... Tomorrow the same system could be used to add level monitoring or personnel access alarm capabilities.

Consult your BS&B wireless representative today. Invest in one flexible wireless instrumentation system.

BS&B Wireless is continuously expanding the capabilities of SmartSystem. Please consult our website for the latest information.

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