

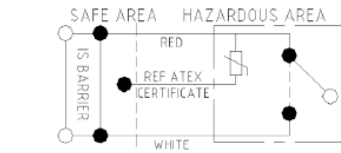
## Flo-Tel™+



Integral Flo-Tel™+ provides an excellent technical solution for identifying when a bursting disc has functioned within arduous operating conditions. Flo-Tel™+ is a non-invasive burst detector with IP65 rating and ATEX approval. When used with Radio-Tel it has the added capability of monitoring process temperature from -55°C to +250°C.

Material	Stainless steel encapsulated switch with peak end cap
Cable	Supplied with 2m cable and connector
Circuit voltage	$U_i < 50v$
Circuit current	$I_i < 250mA$
Temperature	Integrated Thermistor with temperature monitoring of -55°C to +250°C when used with Radio-Tel
ATEX approved	Yes zone 0
Protection IP rating	IP65

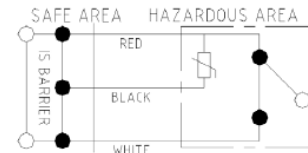
### Electrical Circuit Without Temperature Monitoring



IS BARRIER: INSTALL 1  
 $U_i \leq 50V$   
 $I_i \leq 250mA$

FT  
 $+ 300^\circ C$   
 $- 100^\circ C$

### Electrical Circuit With Temperature Monitoring



IS BARRIER: INSTALL 2  
 $U_i \leq 3.9V$  dc  
 $I_i \leq 2mA$   
 $P_i \leq 7.8mW$

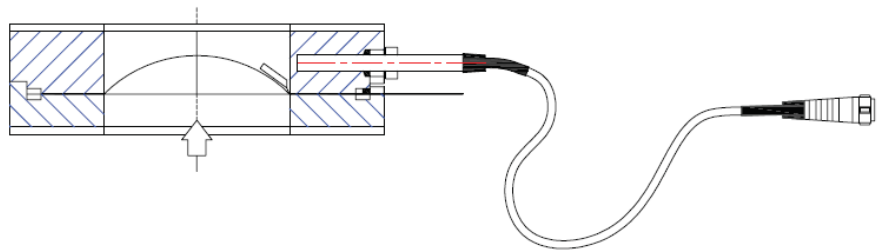
FT  
 $C_i = 0$   
 $L_i = 0$   
 $+ 300^\circ C$   
 $- 100^\circ C$

### Protection IP Rating Explained

First Digit (Solids)	Second Digit (Liquids)
0 = No protection	0 = No protection
1 = Solid objects above 50mm, e.g. accidental touching by hands	1 = Vertically falling drops of water
2 = Solid objects over 12mm, i.e. fingers	2 = Direct sprays of water up to 15 degrees from vertical
3 = Solid objects over 2.5mm e.g. tools	3 = Sprays up to 60 degrees from vertical
4 = Solid objects over 1mm e.g. small wires	4 = Water spray from all directions – limited ingress permitted
5 = Dust limited ingress permitted	5 = Low pressure water jets limited ingress permitted
6 = Dust total; no ingress permitted	7 = Immersion between 15cm and 1m
	8 = Long periods of immersion under water

### Compatibility

Integral Flo-Tel™+ is compatible with most of the Elfab Bursting Disc range. When used with Radio-Tel, the Flo-Tel™+ is easy to install and simply plugs into the Radio-Tel transmitter removing the need for any expensive wiring costs.



# Radio-Tel Receiver



Receiving health signals from the data transmitters the receiver modules are pre-set to allow for both hardware and software monitoring. Receiving signals from a distance of up to 0.5km\* the receiver can support the automatic control of up to 16 transmitters. By hardwiring the receiver into the process control relays, Radio-Tel can indicate the status of a process by either stopping it or triggering an alarm. The receiver module is IP65 rated and can be supplied with a battery back-up (recommended).

Operating frequencies	434MHz
Radiated power	<10Mw
Modulation	FM
Antenna type	Fixed – ¼ wave rubber flexible
Power source	External 110/220v AC with an optional external battery backup input
Dimensions	90x160x250 ex antenna and connectors
Maximum weight	2Kg
Mounting	Screw mounting
Colour	Grey
Protection IP rating	IP67
Operating environment	Recommended for indoor use only -20°C to + 55°C non-condensing
Number of devices supported	Up to 16

## Protection IP Rating Explained

### First Digit (Solids)

- 0 = No protection
- 1 = Solid objects above 50mm, e.g accidental touching by hands
- 2 = Solid objects over 12mm, i.e fingers
- 3 = Solid objects over 2.5mm e.g. tools
- 4 = Solid objects over 1mm e.g small wires
- 5 = Dust limited ingress permitted
- 6 = Dust total; no ingress permitted

### Second Digit (Liquids)

- 0 = No protection
- 1 = Vertically falling drops of water
- 2 = Direct sprays of water up to 15 degrees from vertical
- 3 = Sprays up to 60 degrees from vertical
- 4 = Water spray from all directions – limited ingress permitted
- 5 = Low pressure water jets limited ingress permitted
- 7 = Immersion between 15cm and 1m
- 8 = Long periods of immersion under water

## Installation

The Radio-Tel receiver should be connected to a clean and stable power supply. Elfab recommend the use of linear power supplies. For supply where interruption is to be protected against Elfab recommend one of their battery backups are in place.

## Location

For indoor installations it is recommended that the receiver is located away from sources of heat and electrical apparatus, preferably wall mounted.

## Programming

For the receiver to operate it needs to be programmed with the addresses of the transmitters it is expected to receive. Elfab's Test-Tel installation aid can support this activity.

\*For larger sites a repeater should be used

# Radio-Tel Repeater

The IP65 rated repeater aerials are designed to receive and forward messages from the data transmitters to the receiver or to boost signals in areas where obstructions may affect signal strength. The mains powered repeater aerial covers a range of up to 200m. The repeater should be mounted (in a non-Atex zone) with the supplied bracket with the antenna vertically orientated.



Operating frequencies	434MHz
Radiated power	<10Mw
Modulation	FM
Antenna type	Fixed – ¼ wave rubber flexible
Power source	External 110/220v AC
Dimensions	175x80x60mm excluding antennas
Maximum weight	0.5Kg
Mounting	Screw mounting
Colour	Grey
ATEX approval	No
Protection IP rating	IP65
Displays and controls	“LED” display on the outside
Configuration	The repeater will automatically self configure
Operating environment	-20°C to +55°C

Protection IP Rating Explained	
<b>First Digit (Solids)</b> 0 = No protection 1 = Solid objects above 50mm, e.g. accidental touching by hands 2 = Solid objects over 12mm, i.e. fingers 3 = Solid objects over 2.5mm e.g. tools 4 = Solid objects over 1mm e.g. small wires 5 = Dust limited ingress permitted 6 = Dust total; no ingress permitted	<b>Second Digit (Liquids)</b> 0 = No protection 1 = Vertically falling drops of water 2 = Direct sprays of water up to 15 degrees from vertical 3 = Sprays up to 60 degrees from vertical 4 = Water spray from all directions – limited ingress permitted 5 = Low pressure water jets limited ingress permitted 7 = Immersion between 15cm and 1m 8 = Long periods of immersion under water

### Transmission range

The repeater has been designed on the basis of an intelligent store and forward technology. Holding the address and message counter of the repeated message and bearing them from repeat in the event of a second repeater being present within a given time window. New messages with a changed message counter and/or address will however be repeated. Transmissions not fitting the unique Radio-Tel protocol will be ignored.

### Installation

Mounting the bracket is simple. The pre-welded bracket should be used to secure the the unit to a wall such that the antenna is vertically orientated. Note there is a safety Earth bonding cable between the lid and the main chassis which should not be removed. Normally it is not necessary to remove the cover, in the event of it being necessary to remove the cover this should be done after isolating the power.

### Note

We do not recommend the use of the unit outdoors without additional protection, all leads and connectors should be suitably protected.

# Radio-Tel Software



Monitoring up to 16 transmitters on one screen the Radio-Tel software indicates an error in the process within 5 seconds. Updates are sent from the transmitters to the receiver every minute displaying options on the local or remote PC. Status icons change to indicate an error state offering a simple visual indication that a problem has occurred within the process. For non-manned control rooms Elfab recommend hardware control or alarm signals are in place.

Software	CD provided
Connection	The receiver connects to a PC via a USB or COM port connection
Data type	Hex coded data
Display	Screen resolution - 1024x768 pixel or higher graphical display
System features	Password protection / Full system set-up / Device connection management / Complete system dashboard display / Online help
Minimum PC specifications	1.5 GHz processor / 512MB Ram / CD Drive
Operating software	Windows XP or above
Other system requirements	Serial port or USB port
Internet	Internet Explorer 7

## Beacons / Sirens



For unmanned control rooms and for improved warning alert Elfab offer a range of pre-wired beacons and sirens. Various options available for inside or outside the control room. All sirens are available with voice activated warning signals and can be pre-recorded with the language of your sites location.

Designed for industrial use the various options ensure that there is a siren / beacon available for almost any location, including ATEX approved zones.

# Radio-Tel Data Transmitters



The pre-wired data transmitters are easily connected to the Flo-Tel™+, reducing time consuming and expensive wiring. Sending a health message to the receiver every minute the fail-safe data transmitters wirelessly feed information to the receiver indicating the state and temperature of the process. At a frequency of 434MHz a change in disc status is alerted within 5 seconds. Located around the site in close proximity of the Flo-Tel™+ the data transmitters are fully ATEX approved with an IP67 rating.

Operating frequencies	434MHz
Radiated power	<10Mw
Modulation	FM
Antenna type	Fixed
Power source	Battery (Non replaceable)*
Dimensions	170x35x45mm
Maximum weight	0.2Kg
Mounting	Click and Tie – Mounting bracket supplied separately
Colour	Black
ATEX approval	Yes zone 0
Protection IP rating	IP68 Transmitter, IP67 wire connector
Connections	Pre-wired to allow for full Plug and Pay use
Temperature	Reliable Operation -20°C to +65°C

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### Operating conditions

The transmitter has been engineered to withstand extremes of environment and climatic abuse. It can tolerate short-term to medium-term water submission, operate at arctic temperatures as low as -20°C and peak ambient reaching 65°C. However in order to maximise battery life we recommend an average operating temperature of below 60°C. Elfab advise that the transmitter is replaced every 3 years.

### Transmission range

The antenna of the transmitter is integrated within the narrow, tubular portion of its housing, therefore for maximum transmission range the antenna should point upward and should be kept clear of obstructions, in particular metallic surfaces such as manhole covers, ducting and pipes. In the event that the transmitter can only be mounted horizontally only a small amount of transmission will be lost. In the event of this occurring Elfab recommend Repeaters are installed.

The transmitter has a pre-fitted fixing cable and is supplied with an optional mounting bracket. Mounting on metallic pipes parallel to the antenna should be avoided if you are looking to achieve maximum distance. Always attempt to use a plastic pipe in preference to metal when mounting for maximum signal strength.

### Disposal

At the end of their useful battery life (3 years) the transmitter should be disposed of via a suitable recycling centre. Do not dispose of with normal waste. Do not burn.

\*The transmitter must be replaced every 3 years