

RF Specifications & Modulation Format

INTRODUCTION

The 900MICROPULS Transceiver is designed especially for OEMs who would like to incorporate the advantages for wireless technology into their products. It is an effective solution for sending data over relatively short distances.

The WorldWireless Communications 900MicroPulse FEATURES include:

- g** Small
- g** Affordable
- g** Simple Integration
- g** Operates in License-free FCC Part 15 ISM Band
- g** No post-production tuning required

WorldWireless Communications 900MicroPulse SPECIFICATIONS:

Receiver:

Modulation Type	AM Single-Conversion Super Heterodyne
Frequency	916.5 MHz +/- 300 kHz @ 3dB down
Sensitivity	-104 dBm +/- 3dB @ 5 Volts supply
Modulation Type	AM ASK or OOK

Transmitter:

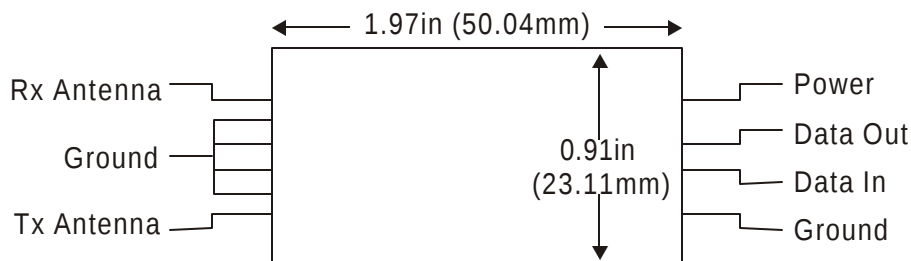
Type	SAW-controlled ASK or OOK
Frequency	916.5 MHz +/- 150 kHz
Effective Radiated Power (ERP)	25mW nominal peak power @ 5 Volts supply
Maximum Data Rate	2400 bps maximum-depends on modulation type
Interface	TTL (Transistor-Transistor Logic) or CMOS

Power Requirements

Supply Voltage	4.5 - 6 Volts dc (3 volts on special order)
Average Current Consumption	32mA receive mode, 25 mA transmit @ 5 Volts supply

Dimensions

Width	0.91 inches (23.11mm)
Length	1.97 inches (50.04mm)
Height	0.35 inches (8.89mm)
Temperature Range	-30 to +70EC



Applications

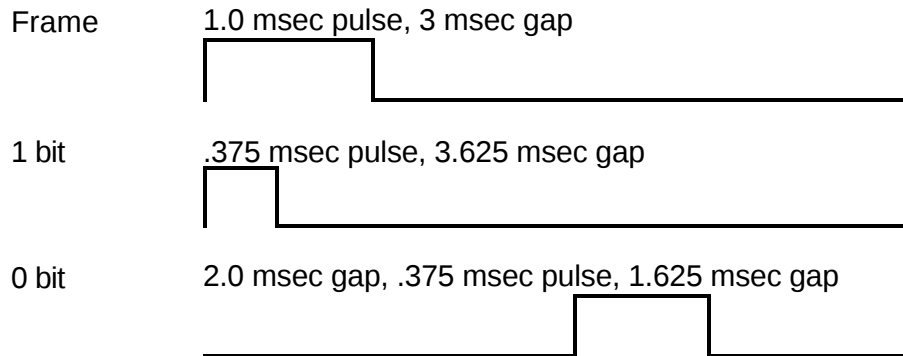
Telemetry, SCADA, Remote Monitoring, Security and Alarm, Transportation, Agriculture Controls, Manufacturing

Handheld Unit to Main Control Unit

The command packet is transmitted and the unit waits 3 seconds for a response. If the unit does not receive a response, the unit will repeat the packet twice at 3 second intervals. The reception of a response will terminate the retransmit cycle. Failure to receive a response will result in a "nc" condition and the unit will wait for either keyboard entry or sleep mode time out.

Each packet consists of 96 bits;

Each bit is formatted as follows:



1. The first 24 bits sent are frame bits.
2. The following 72 bits are broken into groups of 9 bits.
3. The first 3 groups consist of a frame bit followed by eight 1 bits.
4. The next 9 bit group is a frame bit followed by a 0 bit and then the 7 bit address of the unit.
5. The next 9 bit group is a frame bit followed by bits D15 through D8 of the command word.
6. The next 9 bit group is a frame bit followed by bits D7 through D0 of the command word.
7. The next 9 bit group is a frame bit followed by an 8 bit check sum of the address and command word.
8. The last 9 bit group is a frame bit followed by eight 1 bits.

Note all bytes or words are transmitted MSB first.

```
FFFFFFFFFFFFFFFFFFFFFFFF11111111F11111111
F11111111F0AAAAAAAFDDDDDDDDFDDDDDDD
      6 5 4 3 2 1 0   1 1 1 1 1 1 9 8   7 6 5 4 3 2 1 0
                        5 4 3 2 1 0
FCCCCCCCCCF11111111
  7 6 5 4 3 2 1 0
```

The command word is formatted as follows, note: if a command bit is set then the function is active.

- | | |
|-----|---------------------|
| D15 | SETPOINT D5 |
| D14 | SETPOINT D4 |
| D13 | SETPOINT D3 |
| D12 | SETPOINT D2 |
| D11 | SETPOINT D1 |
| D10 | SETPOINT D0 |
| D9 | CALIBRATION COMMAND |

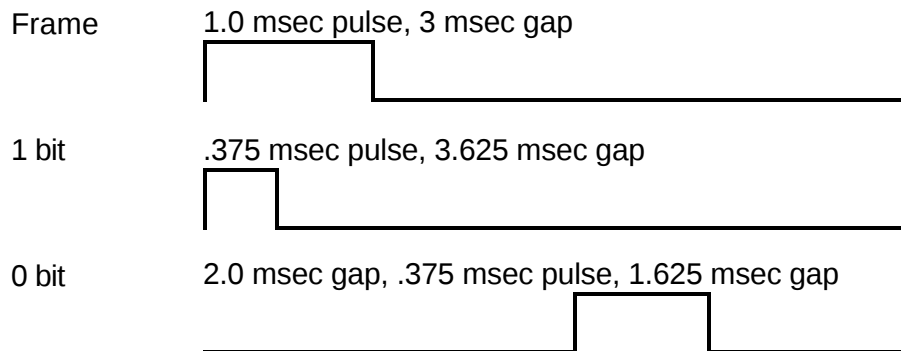
D8	STATUS REQUEST COMMAND
D7	(not used, set 0)
D6	THERMOSTAT COMMAND
D5	LIGHT COMMAND
D4	JETS COMMAND
D3	AUXILIARY 3 COMMAND (usually bubbler or blower)
D2	AUXILIARY 2 COMMAND
D1	AUXILIARY 1 COMMAND
D0	(not used, set 1)

Main control unit to Handheld

The Main control unit transmits both command and temperature packets. The command packet contains both commands and temperature set point information. The temperature packet contains a redundant copy of the command information and the current water temperature. All command packets are followed 5 seconds later by a temperature packet and are sent in response to a received command packet, or a status change in a function (command/valve/fireman's time out, of heater on/off). Temperature packets are transmitted solo in the event of a change in the water temperature. The command or temperature packets are repeated 3 in a single transmission and do not require a response from either the hand held or hard wire units.

Each packet consists of 80 bits;;

Each bit is formatted as follows:



Command Packet Format

1. The first 24 bits sent are frame bits.
2. The following 56 bits are broken into groups of 9 bits.
3. The first 3 groups consist of a frame bit followed by eight 1 bits.
4. The next 9 bit group is a frame bit followed by the wait status bit and then the 7 bit address of the unit.
5. The next 9 bit group is a frame bit followed by bits D15 through D8 of the command word.
6. The next 9 bit group is a frame bit followed by bits D7 through D0 of the command word.
7. The next 9 bit group is a frame bit followed by an 8 bit check sum of the address and command word.
8. The last 9 bit group is a frame bit followed by eight 1 bits.

FFFFFFFFFFFFFFFFFFFFFFFF11111111

FWAAAAAFAFFFFFFFFFDDDDDDDDDFDDDDDDDDDFCCCCCCCC
6 5 4 3 2 1 0 1 1 1 1 1 9 8 7 6 5 4 3 2 1 0 7 6 5 4 3 2 1 0
5 4 3 2 1 0

FWAAAAAAAAFDDDDDDDDDFDDDDDDDDDFCCCCCCCC

D9 TEMPERATURE D1
D8 TEMPERATURE D0
D7 THERMOSTAT READY (heater off, water at temperature)
D6 THERMOSTAT HEAT (heater on, water below temperature)
D5 LIGHT STATUS
D4 JETS STATUS
D3 AUXILIARY 3 STATUS (usually bubbler or blower)
D2 AUXILIARY 2 STATUS
D1 AUXILIARY 1 STATUS
D0 (set 0 to denote temperature packet)

W WAIT FLAG (if set, system is in either valve or fireman's timeout)