FCC NOTICE

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses, and can radiate radio frequency energy and, if installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in the particular installation. If this device does cause harmful interference to radio or television reception, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the computer and receiver.
3. Connect the computer into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

CAUTION

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

SPECIFICATIONS

General

Sensor input ..... Full Bridge Strain Gage
Minimum Bridge Impedance ..... 350 Ohms
Sensor input range..... +/-.2mV/V to +/-10mV/V
Gain..... adjustable with external resistor
Excitation ..... +5VDC
Resolution ..... 12 bits (11 bits plus sign)
Accuracy ..... .05% of Full Scale
Sample rate..... 1250 samples/second
Low pass filter cutoff 300Hz
Power supply input ..... 7.5 – 20VDC
Power supply current (w/o sensor) ..... 25 mA

Temperature

Operation..... 0 – 70 deg C
Sensor input Drift..... .01% per deg C

Recommended Battery

Type ..... 9VDC alkaline
Approximate battery life (1000 ohm sensor)..... 16 hrs.

Sensor Developments Inc.

INNOVATIONS IN FORCE MEASUREMENT

Phone: (248) 391-3000

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TELEMETRY TRANSMITTER
MODEL 90305
Operators Manual

The transmitter consists of a strain gage amplifier, a 4 pole low pass butterworth filter, analog to digital converter, control electronics, and a 900MHz radio transmitter. Operation of the transmitter is as follows:

1. Connect the strain gage sensor to the sensor-input pins as shown in Figure 1.

2. Select the desired channel by the proper switch combination as shown in Table 1. Use Figure 1 for a reference.

3. Select the appropriate gain selection with the switches as shown in Table 2. Use Figure 1 for a reference. This selection sets the full scale input range of the transmitter. See the "Selecting Gain" section on the next page for more information.

4. Connect power to the power input pins as shown in Figure 1. Note the polarity. Maximum input voltage is 20 volts DC.

When powered up, the unit will transmit the sensor information to the receiver on the same channel. To obtain maximum range, place the antenna far from other metal objects.

Sensor Inputs
1 +Excitation
2 +Signal
3 -Signal
4 -Excitation
5 Gain resistor (external)
6 Gain resistor (external)
7 Shield

Battery Connection
8 Full bridge input #1
9 Full bridge input #2
10 Battery +
11 Battery -

Mail:
P.O.Box 290
Lake Orion, MI 48361-0290

http://sendev.com

Shipping:
1050 W. Silver Bell Rd.
Orion, MI 48359

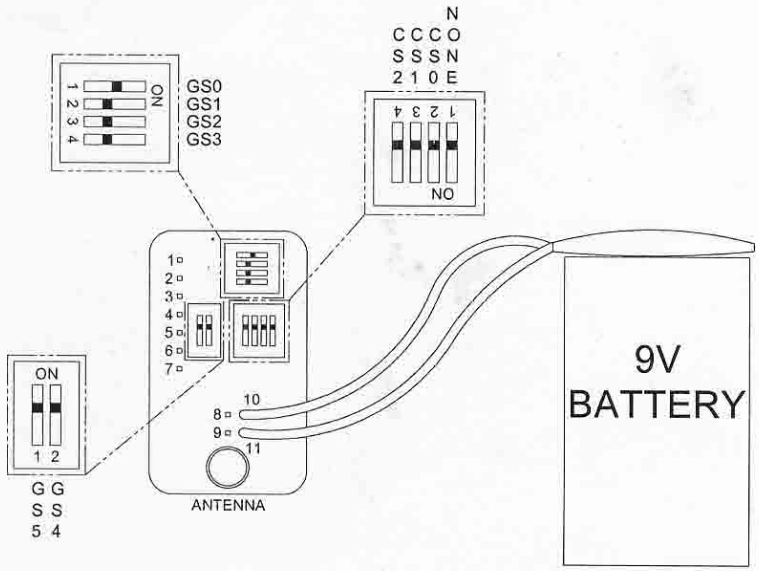

Figure 1 – Transmitter Connections

Freq.(MHz)	CS2	CS1	CS0
903.3	On	On	On
906.3	On	On	Off
907.8	On	Off	On
909.3	On	Off	Off
912.3	Off	On	On
915.3	Off	On	Off
919.8	Off	Off	On
921.3	Off	Off	Off

Table 1 - Channel Selections

SELECTING GAIN

The 90305 transmitter comes equipped with a full adjustment range for gain. No external gain resistor is required for normal operation. There are 6 switches on the package that control the user selectable gain setting. See Figure 1 for switch locations. Table 2 shows the full scale input range of the transmitter vs. the gain switch settings. In each case, GS5 must be set to ON.

Range mV/V	GS4	GS3	GS2	GS1	GS0	Range mV/V	GS4	GS3	GS2	GS1	GS0
4.1	Off	Off	Off	Off	Off	1.9	On	Off	Off	Off	Off
3.9	Off	Off	Off	Off	On	1.8	On	Off	Off	Off	On
3.8	Off	Off	Off	On	Off	1.7	On	Off	Off	On	Off
3.7	Off	Off	Off	On	On	1.6	On	Off	Off	On	On
3.6	Off	Off	On	Off	Off	1.4	On	Off	On	Off	Off
3.4	Off	Off	On	Off	On	1.3	On	Off	On	Off	On
3.3	Off	Off	On	On	Off	1.2	On	Off	On	On	Off
3.2	Off	Off	On	On	On	1.0	On	Off	On	On	On
3.1	Off	On	Off	Off	Off	.9	On	On	Off	Off	Off
2.9	Off	On	Off	Off	On	.8	On	On	Off	Off	On
2.8	Off	On	Off	On	Off	.7	On	On	Off	On	Off
2.7	Off	On	Off	On	On	.5	On	On	Off	On	On
2.5	Off	On	On	Off	Off	.4	On	On	On	Off	Off
2.4	Off	On	On	Off	On	.3	On	On	On	Off	On
2.3	Off	On	On	On	Off	.2	On	On	On	On	Off
2.1	Off	On	On	On	On	Undefined	On	On	On	On	On

Table 2 – Gain Switch Settings

SELECTING A GAIN RESISTOR

Sometimes there will be a need to circumvent the gain setting circuitry built into the transmitter and install a custom gain resistor. This is done by setting gain switch GS5 to the "Off" position. This disables the internal resistor network and allows an external resistor to be installed in its place. The custom resistor must be soldered directly to the gain pins. See Figure 1 for the location of the gain pins.

Select the gain resistor using the following equation;
Rg = (250 x full scale output in mV/V) / (.88 – (.005 x full scale output in mV/V))

Example;
For a 2mV/V full-scale sensor output, using the equation above, we have…
Rg = (250 x 2mV/V) / (.88 – (.005 x 2mV/V)) = 500 / (.88 - .01) = 500 / .87 = 575 ohms.

Choose the standard resistor value closest to the calculated value. Do not go under the calculated value by more than 2%, as this will cause the transmitter to overrange with a full-scale load on the sensor. Choose good quality, low temperature drift resistors. See Table 3 for a list of standard 1% resistors to use for gain and the corresponding input ranges.

Resistor (ohms)	Full Scale Input (mV/V)	Resistor (ohms)	Full Scale Input (mV/V)
174	.6	698	2.4
226	.8	750	2.6
287	1.0	806	2.8
340	1.2	866	3.0
402	1.4	931	3.2
464	1.6	976	3.4
523	1.8	1050	3.6
576	2.0	1100	3.8
634	2.2	1150	4.0

Table 3 – Input Ranges from Gain Resistors

All data sent from this transmitter is encoded with a checksum. This is an error detection scheme that is used by the receiver to tell if the received data was good. When the transmitter's battery gets low, the transmitter will intentionally corrupt the checksum before sending it. The receiver will continually see the transmission as in error. Replace the transmitter's battery when this occurs.

SERVICE WARRANTY

Sensor Developments warrants its products to be free from defects in material and workmanship for a period of one year from shipment from our factory. In that period we will, at our option, repair or replace a defective component or entire product which has been submitted for our examination. This is our sole obligation. We are not responsible for any costs or liabilities arising from but not limited to de-installing, consequent or collateral damage, delays, loss of use, re-installing, or any others. The warranty is in effect provided the component or product is properly used in the application for which it is intended. Products which have been modified without Sensor Developments' approval, on which repairs have been attempted by non-qualified persons, which have been subjected to physical or electrical stress beyond our ratings, or which have had their identifying marks removed or altered are not covered by this warranty.

In cases of incorporation of a product by the user in a larger system provided by a third party or sold on to a third party, we make no warranties except those above. We assume no responsibility for fitness for purpose in these circumstances.

Warranty returns must be authorized by us and shipped prepaid to us. Our return authorization number must appear on the packaging and any correspondence. We will return the goods prepaid. Products, which have been exposed to hazardous materials, will not be accepted unless they have been properly decontaminated. Sensor Developments reserves the right to refuse any shipment which it believes may create a physical or health hazard to our employees.

Products returned out of warranty for repair are subject to a minimum inspection fee. The fee is waived if the repair is authorized. It is also waived if the product is un-repairable and/or a replacement is purchased.

REPAIR SERVICES

Sensor Developments' products requiring repair should be returned freight prepaid to: Attention - Service Department. Information should be included stating what is wrong with the item(s) returned and name of contact. No item shall be returned for repair which has been exposed to hazardous materials without suitable decontamination. Hazardous materials include, but are not limited to: poisons, materials capable of producing toxic fumes, radioactive waste materials which can spread viral or other diseases and materials which pose hazards by airborne ingestion, such as asbestos. Sensor Developments reserves the right to refuse and/or return any shipment which it believes poses any health risk to its employees. Unless the repair is covered under the terms of Sensor Developments' warranty, there will be a minimum inspection and evaluation fee for each item returned. This fee may be waived if the item proves non-repairable, and a comparable replacement is ordered.

Revised: May 28, 2002