WEIGH-TRONIX   SCP-11

This document defines a special purpose serial communications protocol that is used to interface Weigh-Tronix/NCI Model 7010 scales to other computing equipment (eg. personal computers).

TITLE: SERIAL COMMUNICATIONS PROTOCOL: SCP-11 (NCI 7010)					NCI
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OVERVIEW

The purpose of this document is to define the special purpose serial communications protocol that is used to interface Weigh-Tronix/NCI Model 7010 scales to remote computing devices such as personal computers.

The Model 7010 scale uses a simple two wire interface to communicate to a host device. It supports *common* (pin 5 on 9-pin 'D' connector), and *transmit* (pin 2 on 9-pin 'D' connector) lines only. Since there is no receive line, the scale cannot accept commands from the host device. The scale simply transmits its weight and status string (continuously) at a rate of about four times per second. No hardware or software handshaking is required.

NCI 7010 SERIAL COMMUNICATIONS PROTOCOL

```
TITLE:    NCI 7010 Serial Communications Protocol
Desc:     Standard interface for the NCI Model 7010 scale.

Comm:     RS-232, No-Handshake, Continuous Transmit Only
Prot:     n/a (not menu selectable)
Baud:     Fixed. default: 2400,8,n,2
Note:     Fixed ASCII character continuous transmission.
```

Key to symbols used:

<STX>	Start of Text character (02 hex).
<CR>	Carriage Return character (0D hex).
#	Weight characters from scale.
X	Status characters from scale

Command   **Scale Response**

Name: **Continuous weight transmission**

Command: **none**

Response: Weight and status. (see note 1)

        <STX> X X X **# # # # #** **<CR>**

<u>Status Character Bit- Definitions:</u>

```
status char    msb                              lsb
  X X X        b7  b6  b5  b4  b3  b2  b1  b0
  | | |
  | | +-----  1   D2  D1  D0  D7  D6  D5  D4
  | +-------  1   D10 D9  D8  D15 D14 D13 D12
  +---------  1   S6  S5  S4  U3  U2  U1  U0
```

Note: Status characters 2 and 3 (ie status bits D15 thru D0) are related to internal scale operation only and are not for general use. They may be ignored.

'U' Status Bit Definitions:

U3	U2	U1	U0	Description:
0	0	0	0	Normal mode: positive weight
0	0	0	1	Test mode: adjust zero counts
0	0	1	0	Calibration mode: adjust SPAN
0	0	1	1	Displaying: "**tArE**"
0	1	0	0	Displaying: "**Lo**" (low battery)
0	1	0	1	Displaying: "**Err**" (overload)
0	1	1	0	Displaying: "**ErrL**" (zero counts too low)
0	1	1	1	Displaying: "**----**" (negative weight, ie < 0.0)
1	0	0	0	n/a
1	0	0	1	n/a
1	0	1	0	n/a
1	0	1	1	n/a
1	1	0	0	Displaying: "**8888**"
1	1	0	1	Displaying: "**Err**" (tare error)
1	1	1	0	Calibration mode: Tare
1	1	1	1	Displaying "**CAL**" (in calibration mode)

'S' Status Bit Definitions:

S6	S5	S4	Description:
0	0	0	n/a
0	0	1	n/a
0	1	0	Weight is in kilograms
0	1	1	Weight is in pounds:ounces (LSD by 0.1oz)
1	0	0	Weight is in grams
1	0	1	Weight is in pounds:ounces (by 1/4, 1/2, 3/4 oz)
1	1	0	n/a
1	1	1	n/a

WEIGHT STRING EXAMPLES:

	weight chars	status bits
	# # # # #	S6 S5 S4

1) Example of weight in grams:

      123 g = → `0 0 1 2 3`   `1 0 0`

2) Example of weight in kilograms:

      2.10 kg = → `0 0 2 1 0`   `0 1 0`

3) Example of weight in lb:oz (fractional):

	weight chars	status bits
	# # # # #	S6 S5 S4
1 lb, 3 oz =	0 1 0 3 0	1 0 1
0 lb, 6-1/4 oz =	0 0 0 6 1	1 0 1
2 lb, 11-1/2 oz =	0 2 1 1 2	1 0 1
11 lb, 10-3/4 oz =	1 1 1 0 3	1 0 1

4) Example of weight in lb:oz (dec. oz):

	weight chars	status bits
	# # # # #	S6 S5 S4
3 lb, 12.3 oz =	0 3 1 2 3	0 1 1

NOTES:

1) For fractional ounce weight values, the least significant character is interpreted as follows:

      0 = (no fractional ounces)

      1 = (1/4 ounce)

      2 = (1/2 ounce)

      3 = (3/4 ounce)

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