ONTRAK CONTROL SYSTEMS
DATA ACQUISITION AND CONTROL

WC [Input Range][Sample Rate][Buffer][Chop]

Input Range

1	± 5.000 V (Gain=1)
2	± 625mV (Gain=8)
3	± 312.5mV (Gain=16)
4	± 156.2mV (Gain=32)
5	± 78.125mV (Gain=64)
6	± 39.06mV (Gain=128)

Vref = EXC+ = 5.000V
Inputs are fully differential.
Readings return 8 digits.
00000000 to 16777215

+V = 16777215
0V = 08388608
-V = 00000000

Sample Rate

	With Chop Disabled	With Chop Enabled
1	4.7Hz (213ms)	1.56Hz (641ms)
2	7.5Hz (133ms)	2.5Hz (400ms)
3	10Hz (100ms)	3.33Hz (300ms)
4	50Hz (20ms)	16.6Hz (60.2ms)
5	60Hz (16.6ms)	20Hz (50ms)
6	120Hz (8.44ms)	40Hz (25ms)
7	150Hz (6.66ms)	100Hz (10ms)

Noise increases with sample rate reducing the effective resolution. See table 2 for effective resolution at each sample rate.

Buffer

| 0 | Buffers Disabled |
| 1 | Buffers Enabled |

When input buffers are disabled the min/max voltage on input pins is -50mV to +5.05V.
(50mV beyond rails)

When input buffers are enabled the min/max voltage on input pins is +250mV to 4.750V .
(250mV less than rails)

Input buffer should be enabled for low impedance loads such as load cells.

Chop

| 0 | Chop Disabled |
| 1 | Chop Enabled |

With Chop enabled, the ADC offset and offset drift are greatly reduced. This is achieved by continuously swapping the input pins on each conversion. With chop enabled, sample rates are reduced.

Chop should be enabled for higher gains (32-128).

NOTES:

1. Power on default word is WC6711. Configures range to +/-39.06mV, 100Hz sample rate, buffers and chop enabled, for an effective resolution of 20 bits.

2. All digits must be specified, and valid, or entire WCnnnn command is ignored.

3. When WCnnnn command is sent, A/D is reset, configured, and a zero scale, and full scale internal calibration is performed. Data not available for up to 6 sample times.

4. Configuration word can be changed on the fly.

5. When data is read at or below sample rate, every reading contains new data. Reading faster than the sample rate results in duplicate readings.

6. WCnnnn command can be used at anytime to initiate calibration sequence.

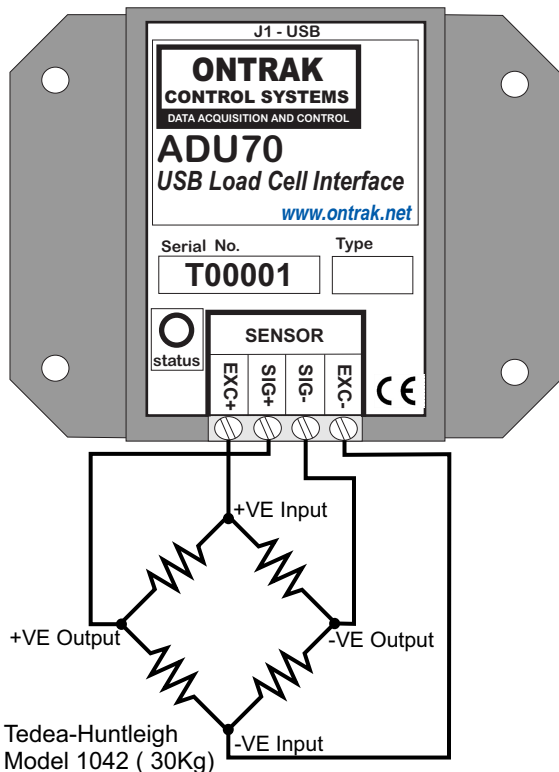**Table 1: ADU70 Configuration Word Worksheet**

	Sample Rate						
	1	2	3	4	5	6	7
1 ± 5.000 V (Gain=1)	24(24)	24(24)	24(24)	22.5(23)	22.5(23)	22.5(23)	22(23)
2 ± 625mV (Gain=8)	24(24)	24(24)	24(23.5)	22.5(23)	22.5(22)	22(21.5)	22(21.5)
3 ± 312.5mV (Gain=16)	24(24)	24(24)	24(23.5)	22.5(22)	22.5(22)	22(21.5)	21.5(21.5)
4 ± 156.2mV (Gain=32)	24(24)	24(23.5)	24(23.5)	22.5(22)	22(21.5)	22(21.5)	21.5(21.5)
5 ± 78.125mV (Gain=64)	23.5(23)	23.5(23)	23(22.5)	22(21.5)	22(21.5)	21.5(21)	21(21)
6 ± 39.06mV (Gain=128)	23(22.5)	22.5(22)	22.5(22)	21.5(22)	21(20.5)	20.5(20)	20(19.5)

Input Range (rows), **Sample Rate** (columns)

Table 2: ADU70 Effective Resolution in Bits - Chop Enabled (Chop Disabled)

Command Summary:
WCnnnn - Resets A/D,configures A/D, initiates zero scale and full scale calibration
RC - Returns Present Configuration Number (4 bytes)
RD - Returns present reading. (8 bytes, 00000000-16777215, includes leading zeros)

J1 - USB

ONTRAK
CONTROL SYSTEMS
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ADU70
USB Load Cell Interface
www.ontrak.net

Serial No.   Type
T00001

status   **SENSOR**
EXC+ SIG+ SIG- EXC-

+VE Input

+VE Output   -VE Output

Tedea-Huntleigh Model 1042 (30Kg)   -VE Input

1. WC6711 configures Range to +/-39.06mV, 100Hz sample rate, buffers and chop enabled, for an effective resolution of 20 bits. This is an ideal setting for 350 ohm wheatstone bridge type sensors.

2. RD command returns reading from 00000000-16777215

mV output (Gain=128) = ((reading/16777215) X 78.12) -39.06

Model 1042 sensitivity is 2mV/V and with a 5.000V excitation from the ADU70, results in a range of +/-10mV.

At 10mV output, load cell is at full scale of 30KG

weight in grams = (**mV output** /10mV) X 30,000

Fig 1 : Typical Application Example

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