Calibrating the Rapidlogger Depth encoder

This tech note describes how to use the Rapidlogger System Utility OR the Rapidlogger Block position utility to calibrate depth OR block position.

- 1) The first step is to ensure that the depth encoder is correctly wired to the Rapidlogger.
- 2) Now switch on the Rapidlogger Unit
- 3) Once the unit is powered up change to the depth encoder quadrature diagnostic screen from the front panel. You can do that by pressing F6, F6, F5, F2, F2
- 4) The following screen will appear on the Rapidlogger LCD panel

Quadrature channels 12 [Hz] *[Quad as Freq= 0] 01: +0.0 Rate: +0.0 TOT01: +0.0 TOT02: +0.0	
<mark>Freq Quad Totals DigOut</mark>	Di ag

- 5) Once you are on this screen turn the encoder shaft clockwise. The number for the values on the LCD screen should increase. And with you rotate the encoder shaft anti-clockwise the number for the quadrature values on the LCD screen should decrease. This means that power is going to the encoder, the encoder is working and the wiring to the Rapidlogger is correct.
- 6) Now if you are calibrating depth on a Drilling or Workover Unit with a draw-works winch and travelling block etc go directly to STEP 18.

USING the Rapidlogger System Utility to Calibrate Depth for CT and Slickline

- 7) The first step is to start the Rapidlogger System Utility on a laptop computer connected to the Rapidlogger Unit over ethernet
- 8) The second step is to click on "Read All from Unit" button

🞫 Rapidlogger System U	tility		
Variable Data Variable Number 1 Variable Name Depth Variable Units ft Decimal Places 1 C	Toggles ☐ Enable ☐ LCD Display ☐ Record/Transmit ☐ CAN Bus Transmit ☐ Noise Filter ☐ Special A ☐ Special B	Rapidlogger Unit Rapidlogger Unit Network 192.168.0.5 Read One from Unit Read All from Unit System Setup Copy Variable	Address Find Rapidlogger Write One to Unit Write All to Unit Sync Time Paste Variable
I/O Type	Multiplier	Local Computer Disk	Read Vars File
1- Quadrature \sim	0.005000000		Read CSV
Quadrature Input Number	Offset		
1 ≑	0.00000000		Write Vars File

- 9) This will load the contents of the setup from the Rapidlogger System memory to the laptop.
- 10) Now press click on the Depth variable on the right so you can see its settings in the setup area on the left

ariable Data ariable Number	Toggles	Rapidlogger Unit Rapidlogger Unit Network Address		V-iddlo- Defined	
ariable Name	LCD Display	192.168.0.5	Find Rapidlogger	1. Depth 2. Speed	E,D,T (Quadrature) E,D,T (QuadratureRate
Depth	Record/Transmit	Read One from Unit	Write One to Unit	3, Weight 4, CircP	E,D,T (Analog) E,D,T (Analog)
ariable Units	CAN Bus Transmit	Read All from Unit	Write All to Unit	5, WHP 6, PumpRate	E,D,T (Analog) E,D,T (Frequency)
ecimal Places	Noise Filter	System Setup	Sync Time	7, PumpVolume 8, N2Rate	E.D.T (FrequencyTotal) E.D.T (Frequency)
\$	Special A	Copy Variable	Paste Variable	9, N2Rate 10, N2Temp	E.D.T (Frequency Total) E.D.T (Analog)
O Type	Multiplier	Local Computer Disk	Read Vars File	32, WeightLimit 33, DepthLimit 34, DeltaLimit	E,D,T (Limit Range) E,D,T (Limit Range) E,D,T (Limit Range) E,D,T (Limit Range)
uadrature Input Number	Offset		Read CSV	40, ShutdownRly	E,D,T (Relay Output)
-	0.00000000)	Write Vars File		
Easy Depth Entry			Write CSV		
Кеер	Undo	Rapidlogger Unit Filesyste	m		
riable Apply OK Variable	Load Ok				
		Copy File to	Rapidlogger Unit		
]	
		About	Close		\sim

- 11) You will now see the Multiplier and Offset for the Depth Encoder Variable on the screen.
- 12) If this is the first time you are calibrating depth you should click on the "Easy Depth Entry" button

Variable Data Variable Number	Toggles	Rapidlogger Unit Rapidlogger Unit Network	Address	Variables Defined	
1 🔶 Move Variable Name	LCD Display	192.168.0.5	Find Rapidlogger	1. Depth 2. Speed	E,D,T (Quadrature) E,D,T (QuadratureRate
Depth	Record/Transmit	Read One from Unit	Write One to Unit	3, Weight 4, CircP	E,D,T (Analog) E,D,T (Analog)
Variable Units	CAN Bus Transmit	Read All from Unit	Write All to Unit	5, WHP 6, PumpRate	E,D,T (Analog) E,D,T (Frequency)
Decimal Places	Noise Filter	System Setup	Sync Time	7, PumpVolume 8, N2Rate	E,D,T (FrequencyTotal) E,D,T (Frequency)
1	Special A	Copy Variable	Paste Variable	9, N2Rate 10, N2Temp 21, DetaWt	E,D,T (FrequencyTotal) E,D,T (Analog) E,T (Calculated Derivat
/O Type	Multiplier	Local Computer Disk	Read Vars File	32, Weight Limit 33, Depth Limit	E,D,T (Limit Range) E,D,T (Limit Range)
1-Quadrature V	0.005000000 🖨		Read CSV	34, DeltaLimit 39, OPSVLimits	E,D,T (Limit Range) E,T (Calculated Multi Sı
Quadrature Input Number	Offset		Write Vare File	40, ShutdownRly	E,D,T (Relay Output)
Easy Depth Entry	•••••••••••••••••••••••••••••••••••••••	Easy Depth Setup			
Кеер	Undo				
ariable Apply OK Mariabl	a Lead Ok	Depth 1	Wheel Dia: ./5		
anable Apply OK Variabl	e Load OK	Encoder Pulse	s Per Rev: 360		
		Gear Ratio from Wheel to I	Encoder 1: 2		
			OK Can	cel	~

- 13) You can enter the depth wheel diameter. For Coiled Tubing this means the diameter of the friction wheel on Injector or Reel. For Slickline this means the diameter of the pinch roller on the slickline unit.
- 14) The value of Encoder pulses per Rev depends on the encoder you have purchased. These are usually listed on the label on the side of the encoder.
- 15) The friction wheel (on a CT unit) or the pinch roller (on a slickline unit) are usually connected with a gear to the encoder. The gear ratio would need to be written in the dialog box. If the gear ratio is 2.7:1 then write 2.7 in this box.
- 16) Click OK and then press "Write One to Unit" and the settings will be saved to the Rapidlogger Unit.
- 17) The Multiplier for speed is 60 times the Multiplier for Depth. This is because speed is usually measured in feet per minute and there are 60 seconds in a minute.

USING the Block position utility to calibrate depth on the Drilling Rig draw-works winch

18) The first step is to start the Rapidlogger Block Position on a laptop computer connected to the Rapidlogger Unit over ethernet



- 19) The second step is to click on the password field and enter "password" as the password. This simple password is in place to prevent users from accidently changing important block position / winch encoder settings on the unit.
- 20) After entering the password click on "Read Settings". Variable setting will be loaded from the Rapidlogger



21) Here you only need to change the "Distance Crown to Floor" to match you exact Rig crown height. This value needs to be exact to a fraction of an inch since this is used to calibrate the depth encoder. The Crown is highest possible position and the Floor is the lowest possible position for the travelling block. If these are not already physically marked on your rig then they please mark them in a permanent manner. These positions will be needed again

later in the calibration and also in the day to day operation to "slip and cut" the winch wire rope.

22) Now exit the Block position utility.

23) Start the block position utility. But do not enter the password this time

w napitiogger block Positi	on Utility	- 🗆 X
Zero Depth	Zero Depth At Floor	Encoder - Engineer Setting Distance Crown to Floor -1- 40.085
Slip and Cut		
Encoder Position At Crown	(1) Read Settings 🥢	1 Onit Ometer
-53	(2) Read Position At Crown	Speed Index:
Encoder Position At Floor		-3BlockSpeed 🗸
34085	(3) Read Position At Floor	Index:
	(4) Write Settings	-4ockPos
-		Password:
	Con the second	Rapidlogger IP Address: 192 . 168 . 0 . 5 Read Settings Write Settings Tech Support Values

- 24) Click on button marked "1". This will read the setup from the Rapidlogger Unit memory.
- 25) Now ask the driller to operate the draw-works winch to move the travelling block to the crown position (highest possible position for the travelling block).
- 26) Click on button marked "2". This will save the crown position value temporarily.
- 27) Click on button marked "3". This will make the system wait for the driller to move the travelling block to the floor position (lowest possible position for the travelling block)
- 28) Ask the driller to operate the draw-works winch and move the travelling block to the floor position.
- 29) Click on button marked "4" (Write Settings). This will save the crown and floor positions in the Rapidlogger System memory.
- 30) Initial calibration is now complete.
- 31) Now every time you need to remove a section of wire rope from the winch you need to repeat the steps 23 to 30.