

HYDROGRAPHIC SURVEY PRODUCTS

KEY DIVIDE / DELAY INTERFACE (KDD)

Technical and Operators Manual

1.0 Overview

The Hydrographic Consultants KDD is a general purpose interface that can Generate, Divide and Delay either internally generated or external Key / Trigger pulses used for Seismic and Hydrographic Surveying equipment. The interface is housed in a compact, rugged enclosure. Control parameters and power are supplied by a USB interface from the host PC

Features

- All parameters configured by USB interface using a simple ASCII sentence.
- KDD interface is powered by the USB interface.
- Internal 1KHz clock can be used as a Master Timing Source which can be divided by any ratio between 1 and 9999 giving Key Rates from 1mS to 9.999 seconds.
- External Key pulse can be divided by any ratio between 1 and 9999
- External Key pulse or the internally generated Key Pulse can be delayed by any time between 1mS and 65 seconds in 1mS increments.
- CMOS / TTL compatible Input Key Pulse.
- CMOS / TTL compatible Output Key Pulse.
- Output Key pulse widths 10 μ S or 1mS Normal or Inverted.

Applications

- ❖ Enables several types of marine survey equipment to be operated at differing trigger rates without interference between them. Two or more KDD's may be used together to eliminate any cross-talk between systems.
- ❖ Water column removal for deep water sub-bottom profiler projects. By triggering the recording system a fixed time after the source has been triggered the water column can be accurately removed from the record.
- ❖ Generation of non-standard trigger rates and delays.
- ❖ Testing and evaluation of Seismic source generators and transmitters.

2.0 Operation

2.1 Installation

Before connecting the KDD to the PC load the supplied VCP drivers onto the PC. They can be copied to any location on the hard drive.

When the KDD is connected for the first time a “Found New Hardware” dialog will appear. Follow the Windows installation instructions and point to the location where the VCP drivers were copied. The KDD will appear in the System Hardware as a USB to Serial converter and will have been assigned a com port number.

To check the assigned Com Port :

Start – Control Panel – System – Device Manager

Scroll down the list to Ports (COM & LPT) press the + to expand the list.

The USB to Serial device will be listed with the assigned COM port number.

To Change the COM Port

Follow the above procedure then:

Double click on the USB to Serial device.

Click the Port Settings Tab.

Click the Advanced Button and then change the Com port to the required number and OK. (See fig 1 for typical Windows screen setup pages)

With the KDD connected to the PC or Laptop power will be supplied to the KDD and it will begin operating using its default settings. The default setting are:

Use Internal Oscillator 1KHz.

Divide Key By 1000 will produce a 1Hz Key rate.

Delay Key By 10mS a second Key will be produced 10mS after the first.

The key pulses will be indicated by the corresponding LED's flashing

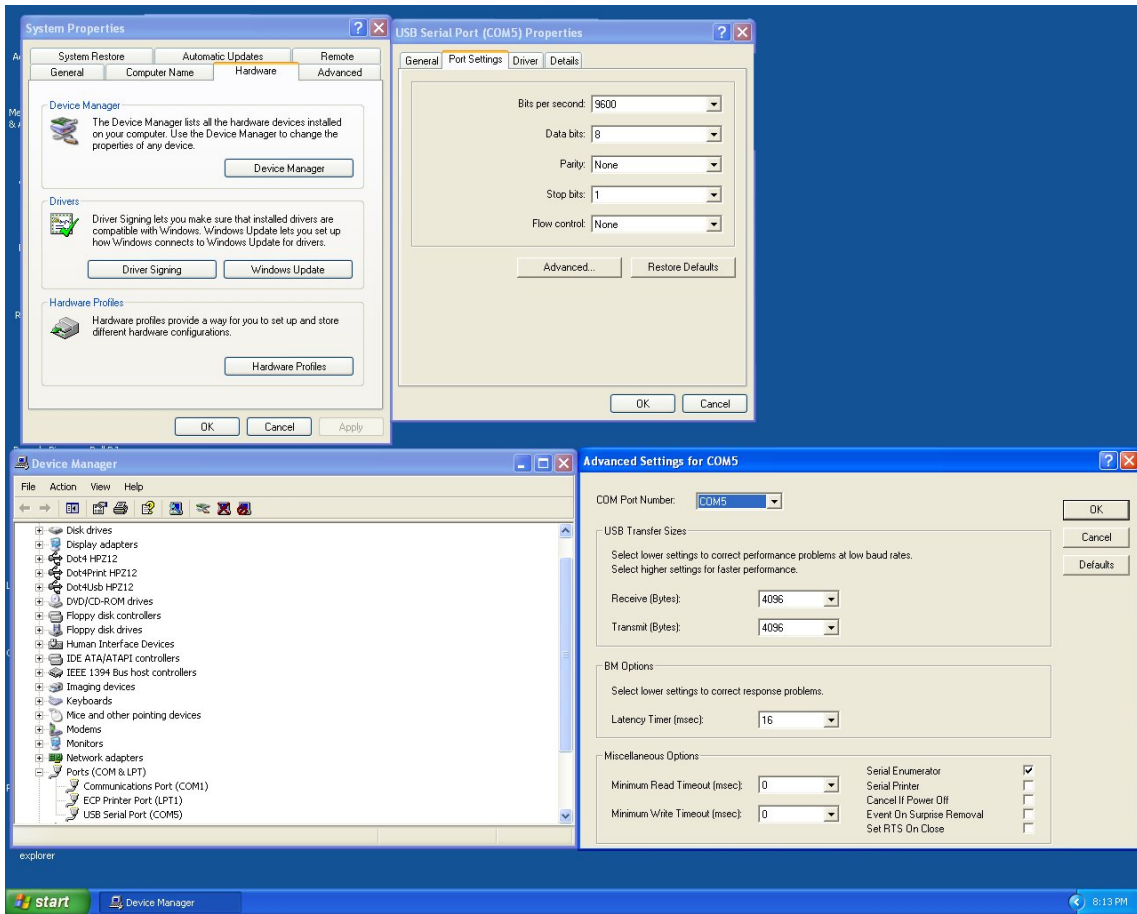
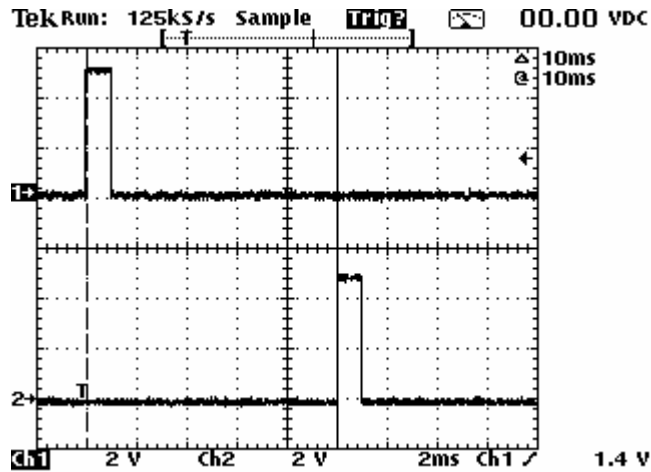


Fig 1 Typical Windows Installation Setup Screens



Scope display of startup default parameters. Channel 1 is the Divided output and Channel 2 is the delayed output

The default settings can be changed at any time by sending an ASCII serial string to the KDD. The format of the string is as follows:

`$*DDDD,LLLLL<cr><lf>`

Where:

- \$ Is the sentence identifier
- * Is the option character
- DDDD Is the Divide Ratio (Number that the input key will be divided by)
- LLLLL Is the Delay Time in mS (0.001 seconds)
- <cr><lf> Is the standard ASCII line terminator

The baud rate is 9600
Parity is None
Stop Bits is 1

The control sentence can be sent to the KDD using either the supplied Utility, Windows Terminal or any other terminal program, or a custom OEM embedded utility.

The HDD does not perform any checks on the operator entered data string so the operator must ensure that the settings entered are sensible.

For example:

If the Master Input Key is 500mS

The Divide is 1 (no divide is performed)

The Delay is 600 (600mS)

The above settings will result in an error condition because the delay is longer than the total cycle time. The delayed Key will be output 600mS after the Master Input Key but because the delay is longer than the input Key rate the Delayed Key will also be divided (by 2 in this case).

The output will only change when the current timing cycle is finished (ie after an output pulse has been generated). The received serial data string is stored internally, when a key is output, by either the divide or delay blocks, the new data is read. This can lead to some long waits if, for example a very long delay is executed in error with a slow key rate. Until this cycle is completed a new configuration string will not be read by the KDD. To overcome this entering an "R" after the \$ will immediately reset the divide processor and rest the KDD to its default configuration. The input string will then be read and acted upon..

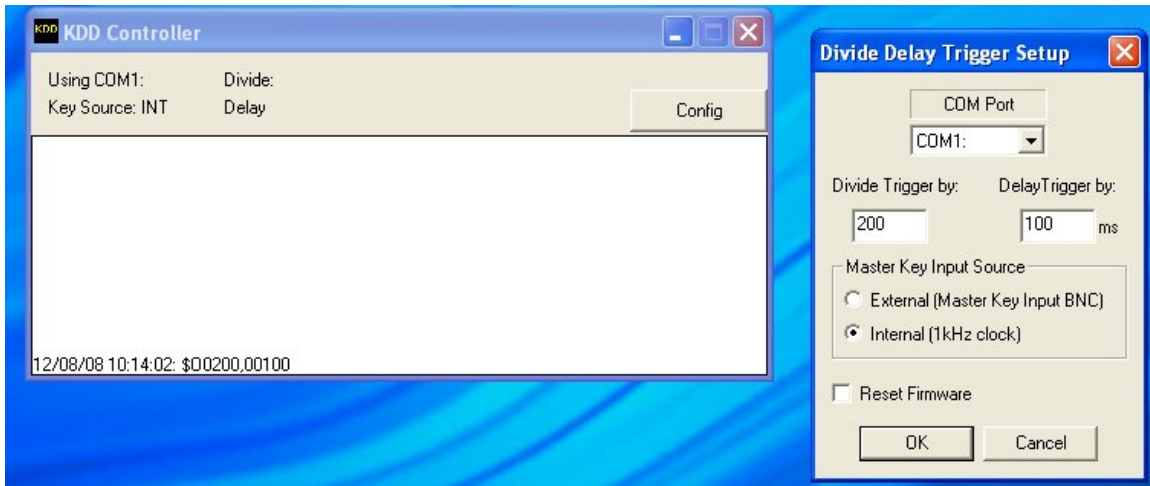
The Reset can be sent if the interface starts acting abnormally or at any other time.

The Reset Function

Placing an "R" immediately after the "\$" in the control sentence will reset the Divide Processor and cause it to return to the default divide settings. The Reset function should only be used when the divide processor is locked-up or when a very slow input key rate and high divide ratio has been entered in error. The serial string is only read immediately after an output key has been generated so if a very large number has been entered for the divide ratio say 2000 with a slow key rate of 2 seconds then the serial string will not be read for 4000 seconds. The KDD could be unplugged from the USB port which will reset the processors or sending an R will have the same effect and a corrected control sentence can then be sent.

KDD Configuration Software Utility

The KDD may be configured by any device or software package capable of generating an ASCII data string at 9600 8N1. A simple utility for configuring the KDD is included on the cd.

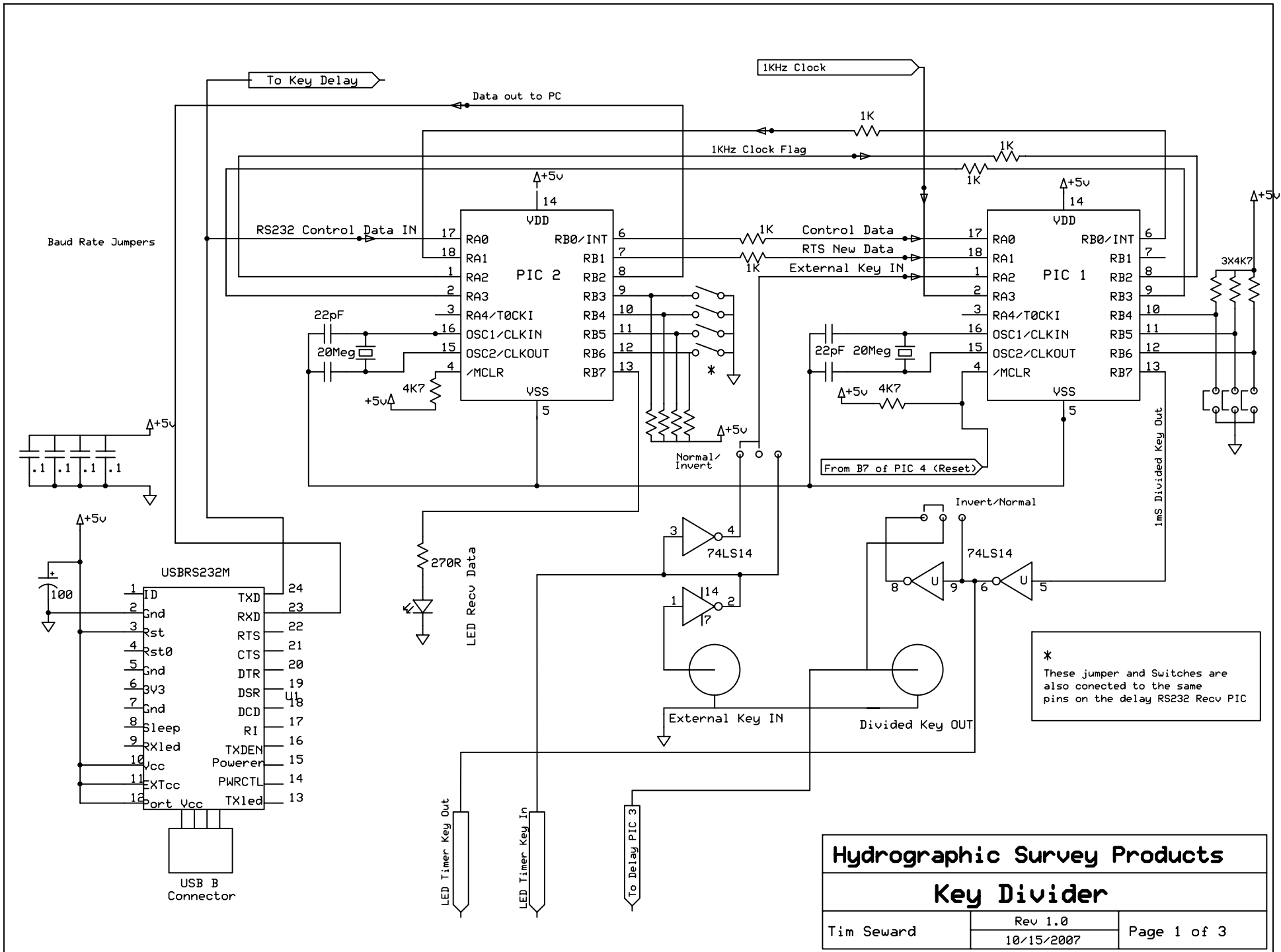


KDD Main and Configuration pages

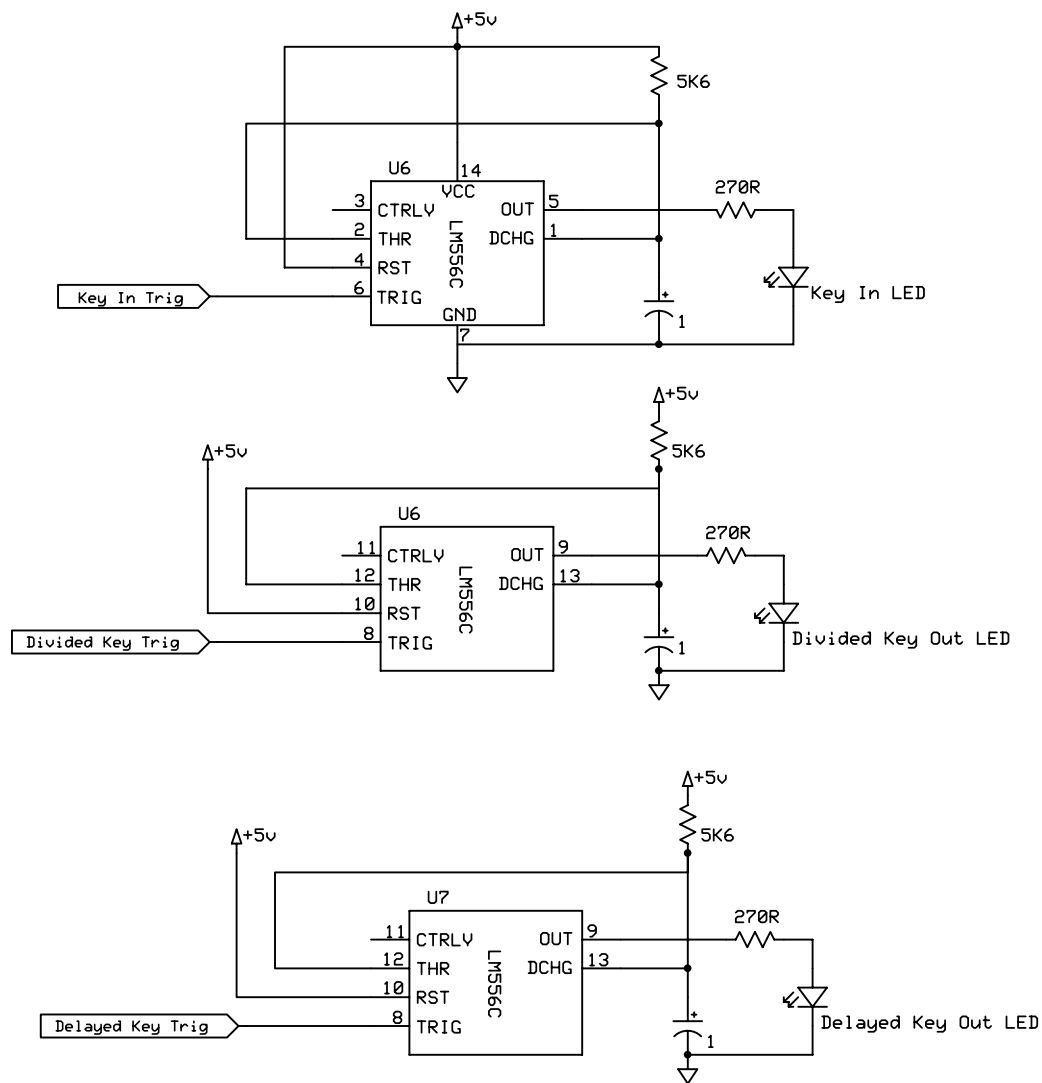
The KDD configuration utility is very simple to operate. The panel on the left is the main display and reports the status string sent by the KDD interface. Pressing the Config button (top left) will bring up the configuration panel shown on the right. Enter the Com Port that has been assigned to the KDD and the required Trigger Divide number and the Trigger Delay Time.

Once the parameters have been set press OK. Check the string that is output by the KDD is correct and the interface is operating as expected. The KDD utility may now be shut down if required.

Checking the Reset Firmware will Reset the KDD interface as described on the previous page.



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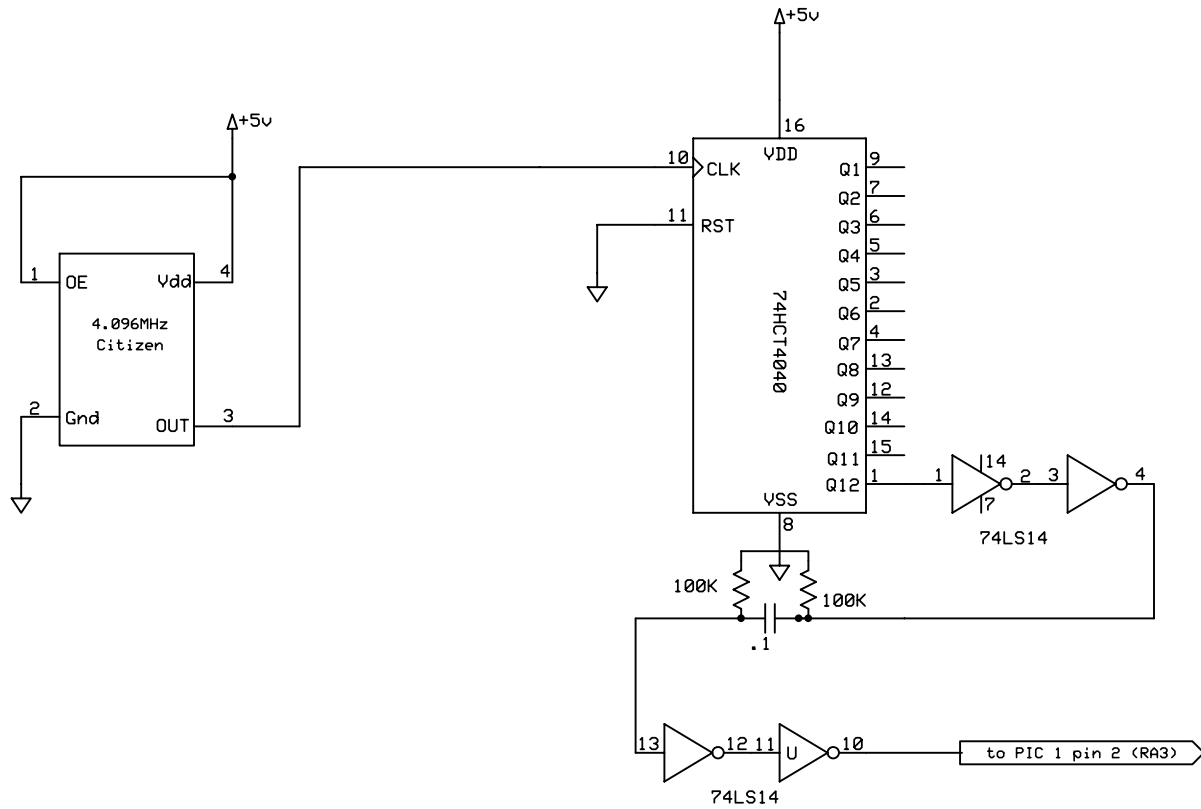
Hydrographic Survey Products

LED & Output Drivers

Tim Seward

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Hydrographic Survey Products		
1KHz Clock Generator		
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Parts List

KDD

Title: **Key Divide / Delay Interface**

Detail: Hydrographic Consultants, Ltd

Rev:

Status: **U**

Date: 1/19/2008

Item	Qty	Part	Type Stat	Title Detail	Reference
1	2	7556IPD CMOS	PS U	CMOS timer 556 replacement	
2	3	BNC FEMALE	PS U	BNC female isolated bulkhead	
3	8	CAP-22PF	PS U	Epoxy Dipped Ceramic Capacitor 22 pF	
4	1	CD74HCT4040	PS U	12-Bit Binary Counter Texas Instruments Logic	
5	4	CRYSTAL-20	PS U	20MHz Crystal HC-49/us	
6	4	DIP SOCK 18 PIN	PS U	Machine Tooled 18 pin DIP	
7	1	DIP SWITCH	PS U	4 Position Dip Switch	
8	4	LED - HOLDER	PS U	Red LED with Holder	
9	1	OSCILLATOR	PS U	4.096 MHz Citizen Oscillator SMD 5V	
10	4	PIC16F84	PS U	Microchip 16F84 Flash Microprocessor	
11	4	RES.270R	PS U	1/4 Watt Resistor - carbon Film	
12	1	SHROUDED HEADER	PS U	.100" 2 row 10 pin header	
13	1	USBRS232M	PS U	USB - RS232 Interface Module DLP Designs	
14	2	74HC14	PS U	Hex Schmitt Trigger Inverter High Speed CMOS	
15	14	RES.4K7	PS U	1/4 Watt Resistor - Carbon Film	
16	12	RES. 1K	PS U	1/4 Watt Resistor - Carbon Film	
17	4	RES.5K6	PS U	1/4 Watt Resistor - Carbon Film	
18	2	3-PIN HEADER	PS U	3 Pin Header Gold Plated	
19	2	CAP .1UF	PS U	Mylar Capacitor	

Parts List

Item	Qty	Part	Type Stat	Title Detail	Reference
20	1	CAP-10UF	PS U	10uF 50V Electrolytic Capacitor	
21	4	CAP - 1.0UF	PS U	Tantalum Capacitor 16V	
22	4	RES. 100K	PS U	1/4 Watt Resistor - Carbon Film	
23	1	CASE_18	PS U	Lansing Micropak Enclosure CT1O60-P2X6	
24	4	SHORTING BLOCKS	PS U	.100" Shorting Blocks	