Application Note
CTAN #142

The Application Note is pertinent to the Unidrive, Mentor II / Quantum III Drive Family

<u>Application of the built-in Comparators and Binary Decoder</u>

On several occasions I've been asked, "What is a practical application of the built-in Binary Decoder" within the Unidrive menu 9. This decoder could be used to select any 1 of the 8 preset speeds for example that the Unidrive has by connecting the decoder inputs to digital inputs for example. Actually, the Unidrive has a built-in decoder method to do this with parameters #1.45, #1.46 and #1.47 already. So what then could we use the "free-standing" decoder for?

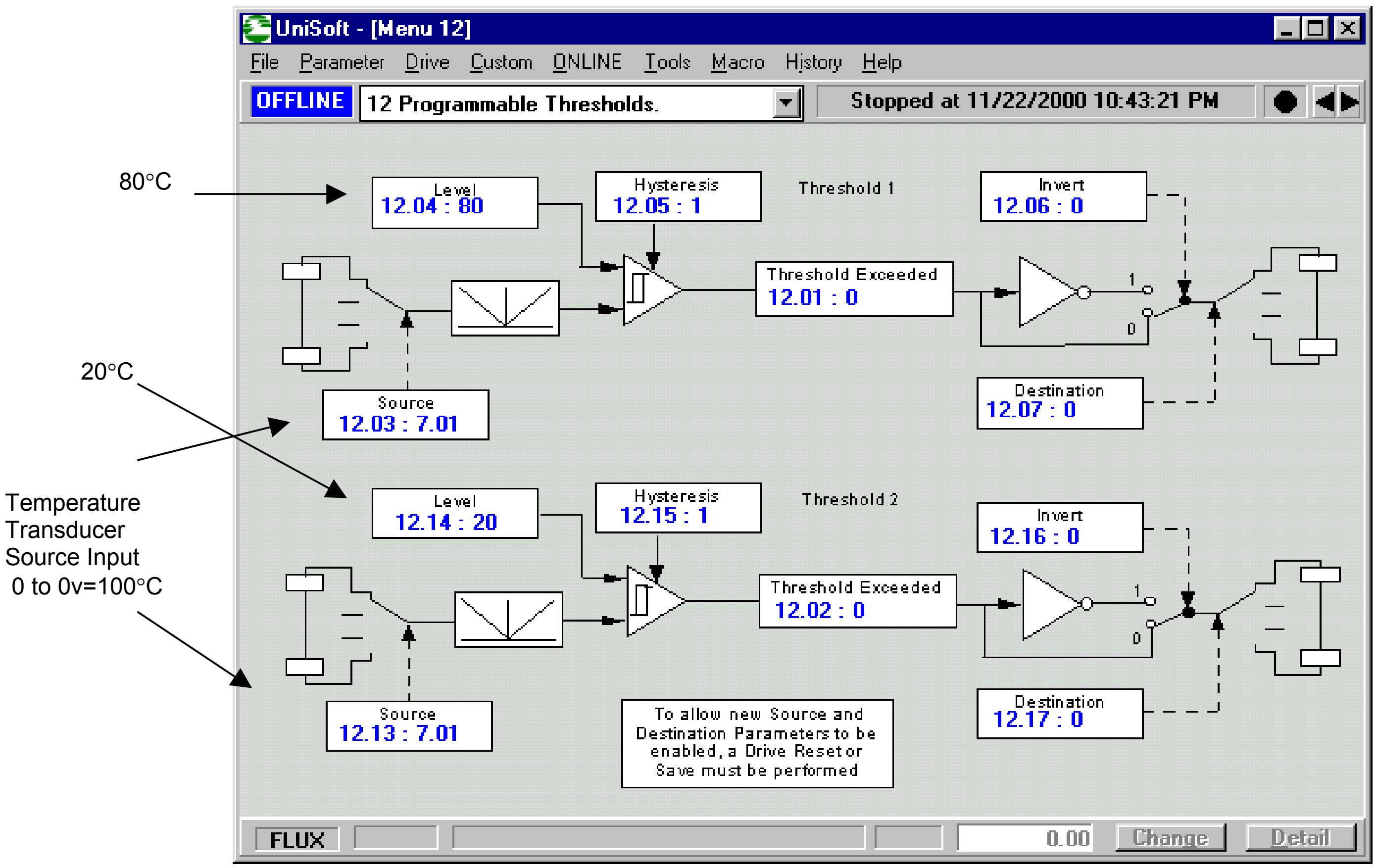
Well, one day a customer called me and asked, "How might one read an analog temperature transducer and display its' temperature on a Keypad/Display unit." This part was no problem but for an added complexity, he wanted to display a message "Temp Too Hi" when the temperature was <u>over</u> a certain point, "Temp Too Lo" when the temperature was <u>below</u> a certain point and "Temp Normal" (or just nothing) when it was within range.

This made things a little more challenging. The problem was the fact that the customer was describing a "tri-state" or 3-state situation. My first inclination was to employ a UD70 and this would be a "*piece of cake*". But the customer indicated that he wasn't very comfortable with the necessary programming that would be required and asked if there wasn't some way we could do it with the Unidrive by itself. Looking around in the Unidrive I bumped into the Decoder block. Perhaps there was a way we could use that to help us solve the application.

As it turns out, the CTIU or Exor UniOp Operator Interface units, have a method to display a unique phrase based upon a number. If we could create 3 different number within the drive based on the transducer temperature, we would have it.

The Temperature Comparators

The determination of when the temperature of the transducer exceeds or is below a certain value is an ideal application of the built-in comparators within Menu 12. To test our situation, we can use the normal speed pot input to simulate the external temperature transducer signal. This can be read at A/D#1's input at #7.01. It will span over the range of 0 to 100 with a 0 to 10v input. If +10v represented 100°C and if we wanted a signal to be a 1 when it was over 80°C and another signal to be a 1 when it was below 20°C, we could configure the Comparators in Menu 12 with the following:



Actually, the lower comparators' output (#12.02) will go to a 1 whenever the temperature exceeds 20°C. But at least it give us intelligence at 20°C.

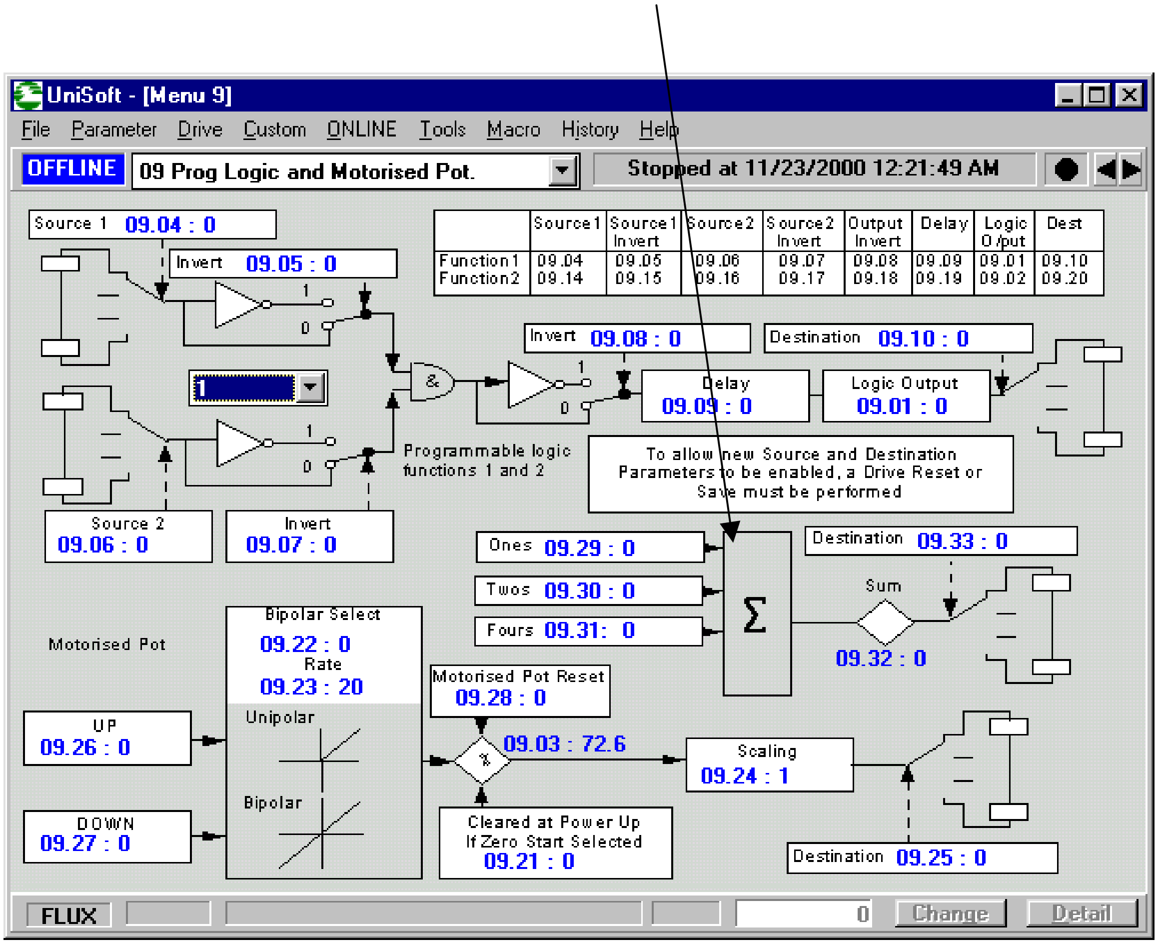
But how can we get the 3 states that we need for Too Hi, Normal and Too Lo ?

Well, that is where the "free-standing" built-in Decoder function comes into play.

Read on…..

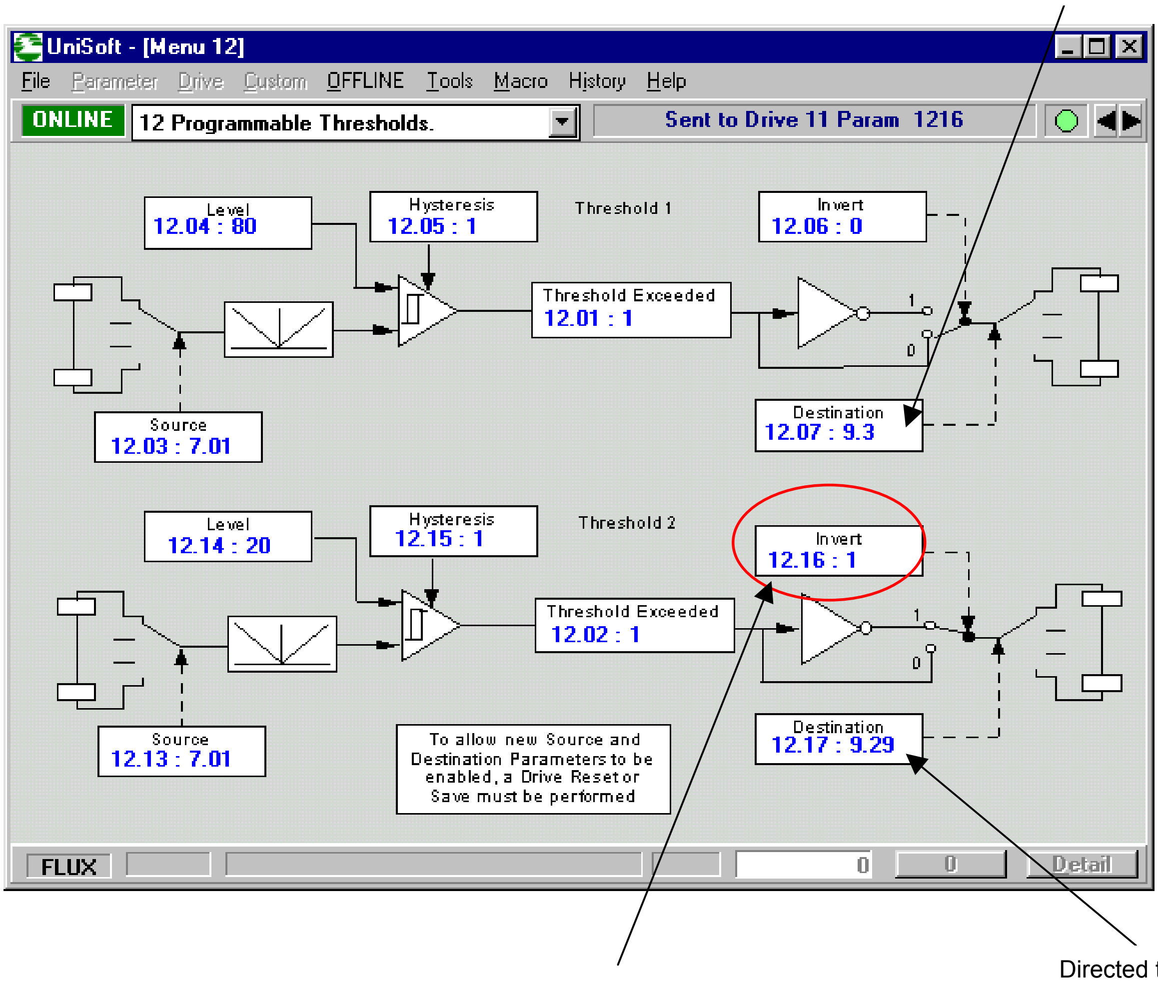
Decoder

If we could direct the output of the comparators to 2 of the inputs of the Decoder, we could get 3 unique decimal numbers that the Keypad/Display unit can monitor and display 1 of 3 unique phrases of our choice.



So, if we direct the Hi Temp comparator to #9.30 and the Low Temp comparator to #9.29 this should do it.

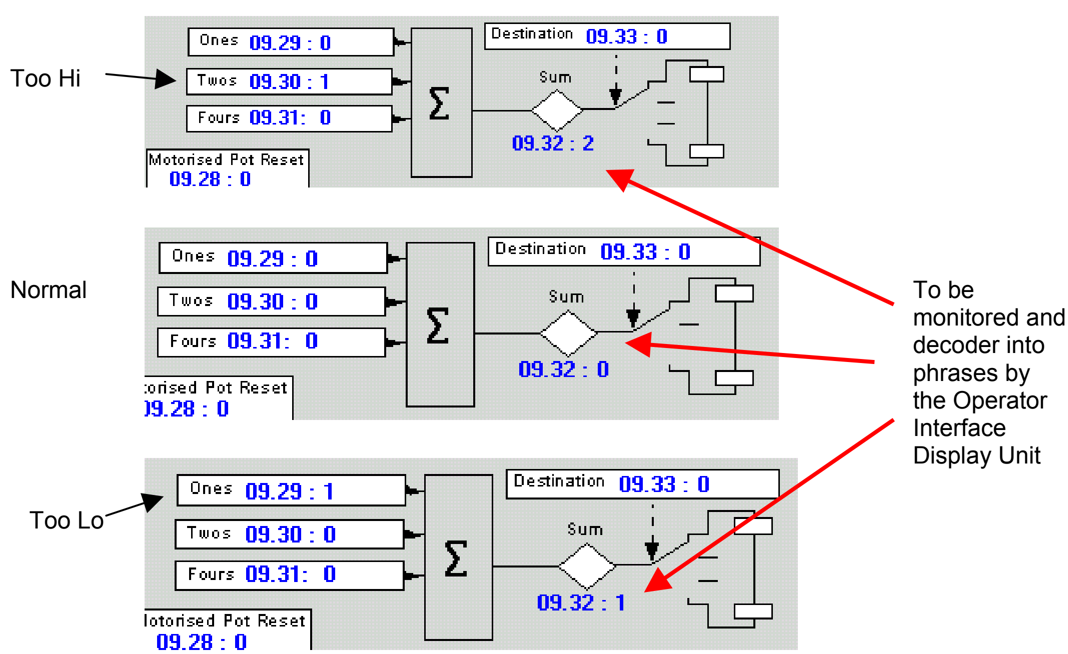
Directed to
#9.30



Directed to
#9.29

Inverted result before
directing to #9.29

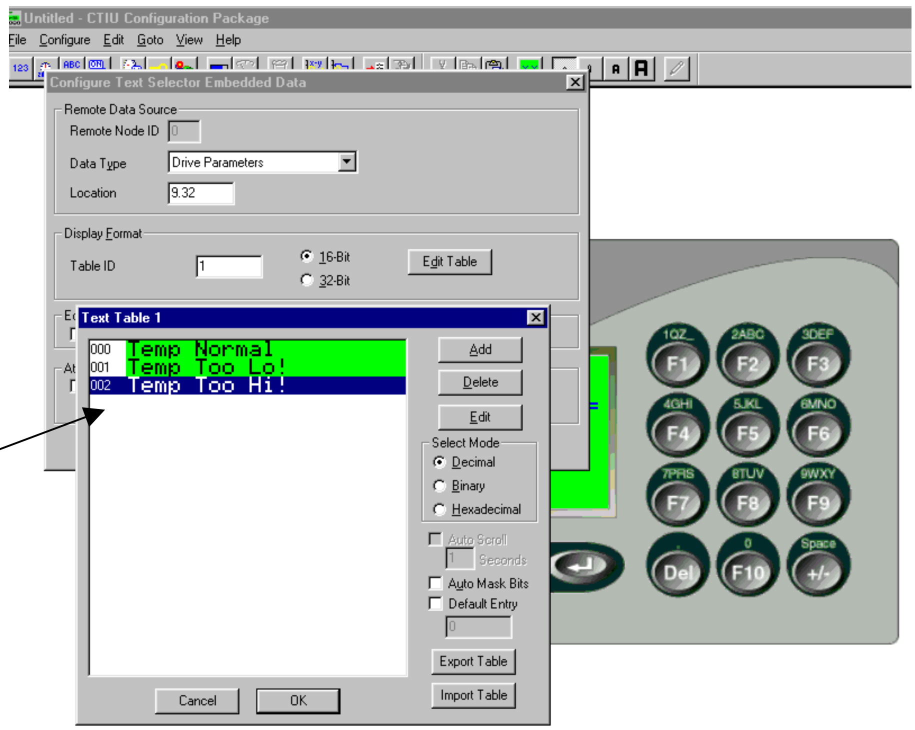
This will give us 3 distinct values depending on the value of the simulated temperature transducer.



The Display Unit

The screen shots below are for the CTIU type keypads but would be similar UniOp's as well.

Reading
#9.32



Phrases

To download a free copy of the CTIU Configuration program and/or UniSoft as illustrated in this application note, click on the link below:

Click here → http://www.emersonct.com/pdProducts/downloads/software.asp

Questions ??   Ask the Author:

Author: **Ray McGranor** **e-mail :** ray.mcgranor@emersonct.com
(716)-774-0093