

The Application Note is pertinent to our CTIU and Unidrive Family Range

Creating a Unidrive Fault Screen with the CTIU Operator Interface Unit

It is often desirable to offer a special Fault Screen on an HMI Operator Interface Unit upon a Drive Fault. This application note will outline a procedure to allow you to create a Fault Screen such as the one shown below on our CTIU multi-line units:



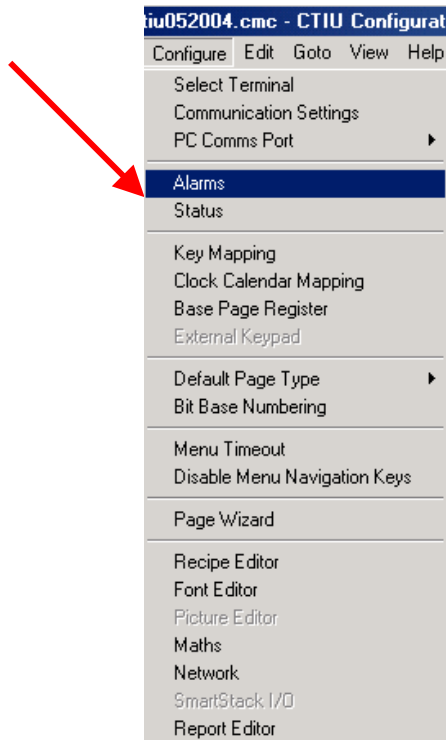
In order to create a Fault screen, you will need the CTIU Configuration program.

The CTIU configurator can be downloaded from our website at or by clicking on the link below:

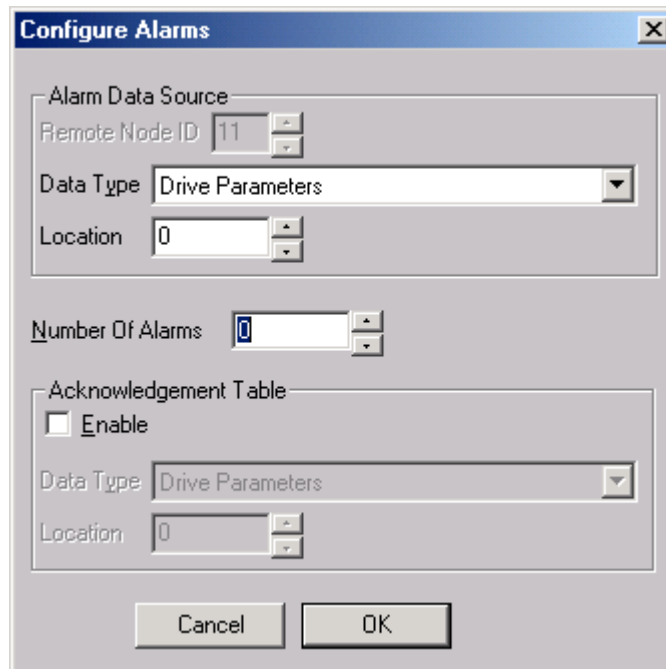
http://www.emersonct.com/download_usa/software_drives.htm

The CTIU has the ability to create Alarm screens which would be called up in the event of a Drive Fault.

An ALARM screen can be setup by selecting ALARMS under the Edit pull down menu:



This will cause the following setup screen to appear:



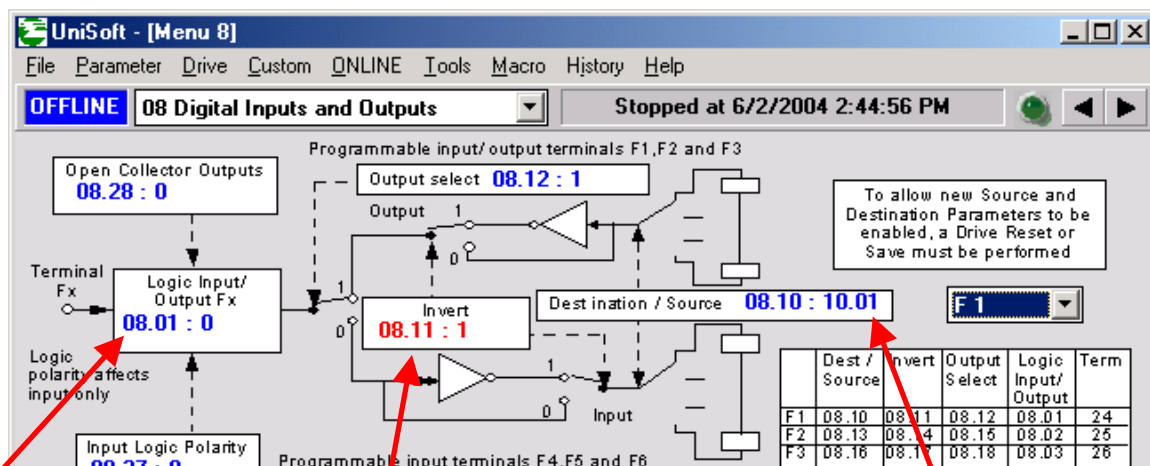
The configurator is looking for a location in the drive that becomes a 1 when an Alarm is to be displayed. Unfortunately, the Unidrive creates a 1 when the Drive is Healthy at parameter #10.01. We need the opposite.

Creating a Drive Tripped or Drive Faulted bit

There are at least a couple of ways I can think of to invert the Drive Healthy bit in order to create a Drive Faulted bit.

#1 The easiest method would be to use an un-used output (if you have one). Check to see if you have any wire on pin 24,25 or 26 of your Unidrive or pins 48,49 or 50 if you are using the UD50 Extended I/O Module.

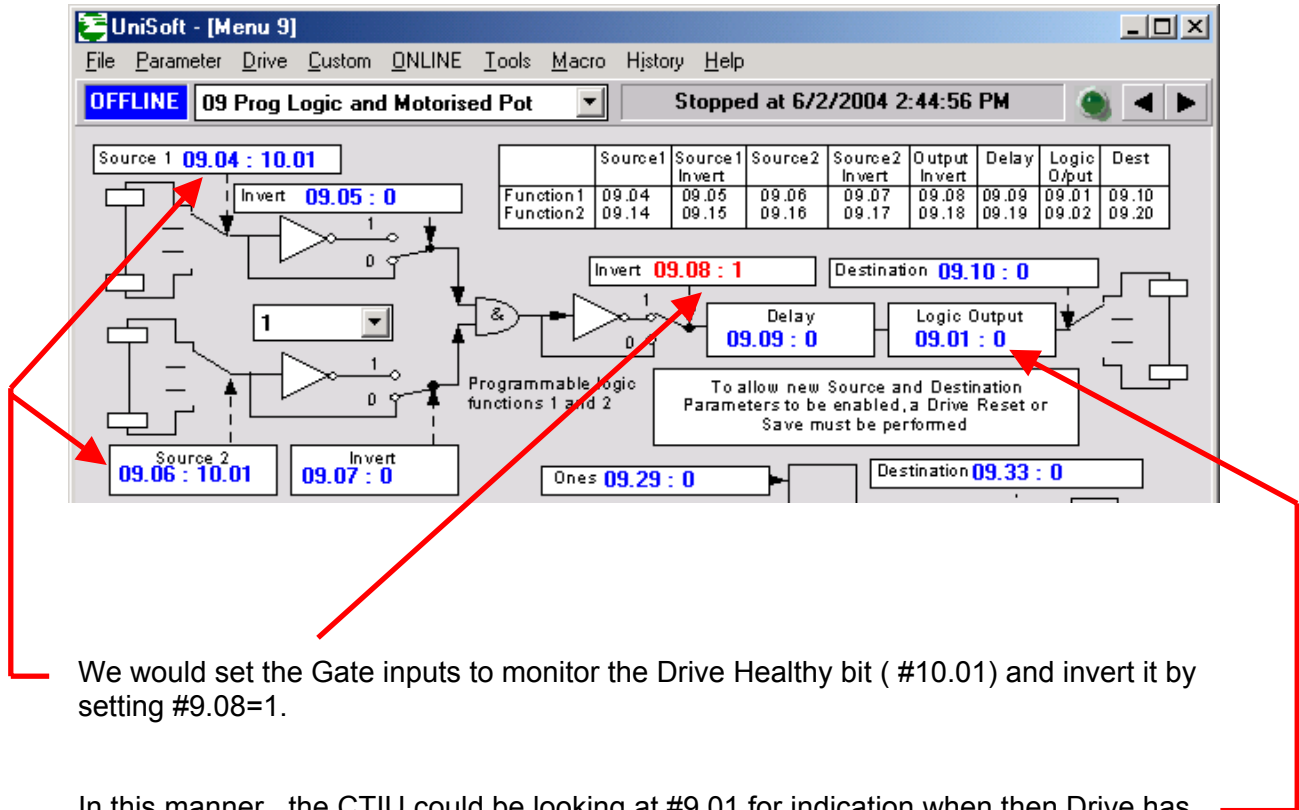
For example, let's say that you did not need the standard drive output that is provided on pin 24 which is typically setup to indicate Zero Speed or At Speed (depending on Open Loop or Closed Loop operation).



All we would need to do is make parameter #8.10 monitor the Drive Healthy bit (#10.01) and invert it by setting #8.11=1.

In this manner, the CTIU could be looking at #8.01 for indication when the Drive has faulted.

#2 Another method that could be used if there were no un-used outputs, would be to use one of the Programmable Logic Gates within Menu 9.

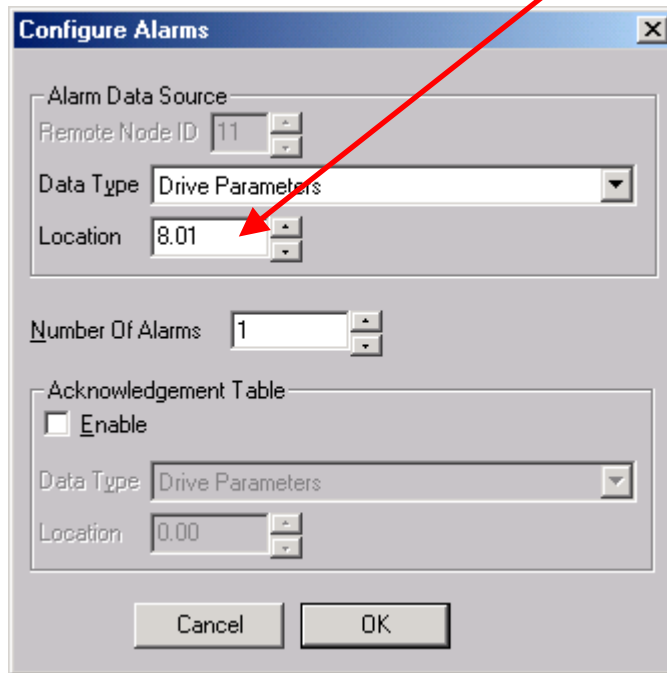


We would set the Gate inputs to monitor the Drive Healthy bit (#10.01) and invert it by setting #9.08=1.

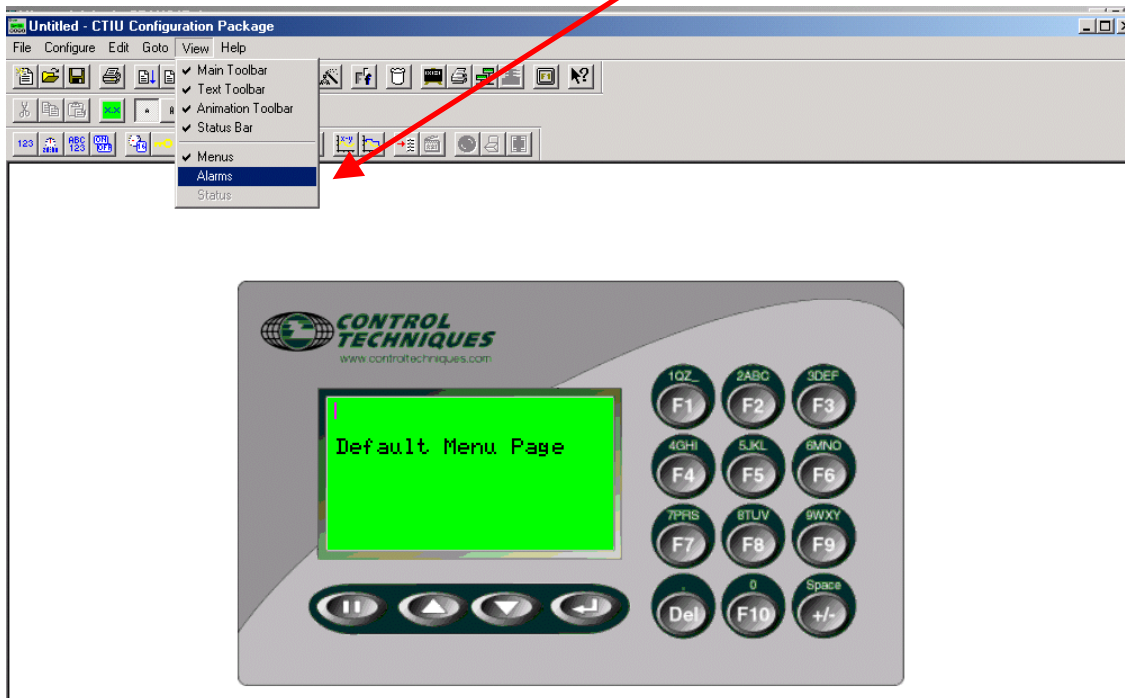
In this manner, the CTIU could be looking at #9.01 for indication when then Drive has faulted.

Once you've decided on a method to create the Drive Faulted bit, you are ready to make the ALARM setup assignments.

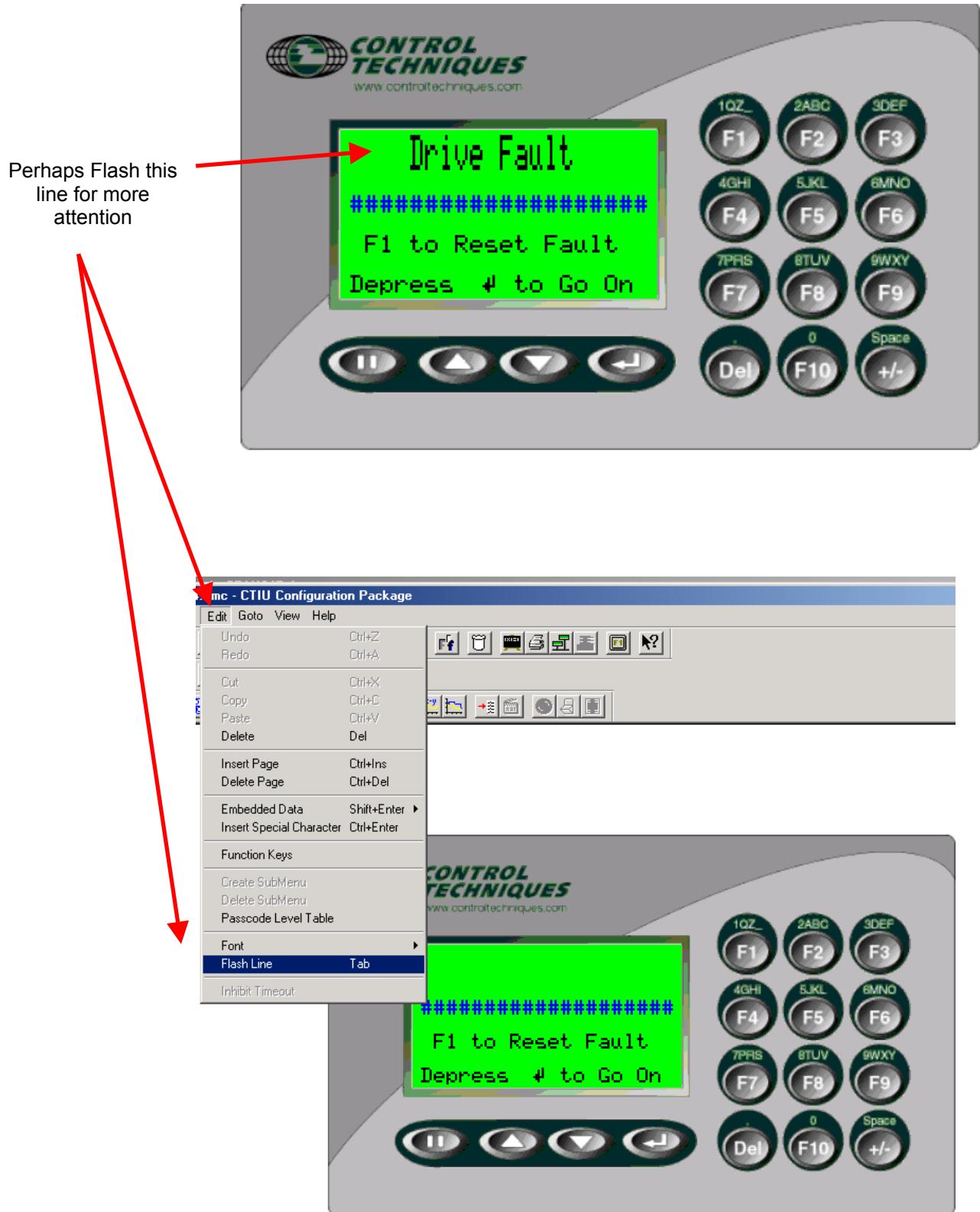
On my setup I was not using pin 24 so I used the method as described in #1. Therefore, the CTIU Alarm page will be activated by parameter #8.01 in the Unidrive.



Once we have setup the ALARM register, we can now create the ALARM or Fault Screen itself.



One could now create a screen similar to that shown below:



Now as far as displaying a phrase for the Drive Fault, we could create a specific phrase for each of the Drive Faults. Listed below are only some of them:

UV	1	DC Bus Under voltage (< 450V DC)
OV	2	DC Bus Over voltage (> 830V DC)
OI.AC	3	AC instantaneous current trip **
OI.br	4	Instantaneous braking circuit over current **
** A delay of 10 seconds is imposed before reset is allowed on Over current trips		
PS	5	Power supply trip (Internal drive fault)
Et	6	External trip (see p10.32)
OV.SPd	7	Overspeed of motor (see p3.08 for threshold)
Prc2	8	Processor 2 trip (UD70 Applications Module)
SEP	9	Trip detected in small option module (eg. Resolver break)
ENC.OVL	10	Encoder supply or F/D output overload
ENC.PH1	11	Encoder phasing failure - U missing *
ENC.PH2	12	Encoder phasing failure - V missing *
ENC.PH3	13	Encoder phasing failure - W missing *
ENC.PH4	14	Encoder phasing failure - UVW connections *
ENC.PH5	15	Encoder phasing failure - A missing *
ENC.PH6	16	Encoder phasing failure - B missing *
ENC.PH7	17	Encoder phasing failure - A/B swapped *
ENC.PH8	18	Autotune general failure*
* Detected during commissioning tests		
It_br	19	IxT on braking resistor (see p10.30)
Oh1	21	Drive overhear (Drive thermal model protection)
It.AC	20	IxT overload in motor (see p4.15)
Oh2	22	Excessive heatsink temperature detected by thermistor (see p7.04)
OA	23	Excessive ambient temperature (>70°C)
TH	24	Thermistor trip - excessive heat in motor (see Input spec)
THS	25	Thermistor short circuit (see Input spec)
Non important trips - drive can stop before tripping if required (see p10.37)		
OP.OVLd	26	Overload of 24V output, or digital outputs
CL1	27	Current loop 1 loss (Trip level is 3mA in 4-20 or 20-4mA modes)
CL2	28	Current loop 2 loss (Trip level is 3mA in 4-20 or 20-4mA modes)
CL3	29	Current loop 3 loss (Trip level is 3mA in 4-20 or 20-4mA modes)
SCL	30	Serial comms loss (serial mode 2 only)
Important trips - drive trips immediately:		
EEF	31	Internal EEPROM failure
Ph	32	Loss of an AC supply phase (Always stops before tripping)more...
rS	33	Failed during stator resistance measurement
ST GL	34	Size 5 Spurious trip
SEP EC	35	Small option module encoder comms failure.
SEP EF	36	Small option module encoder fault.

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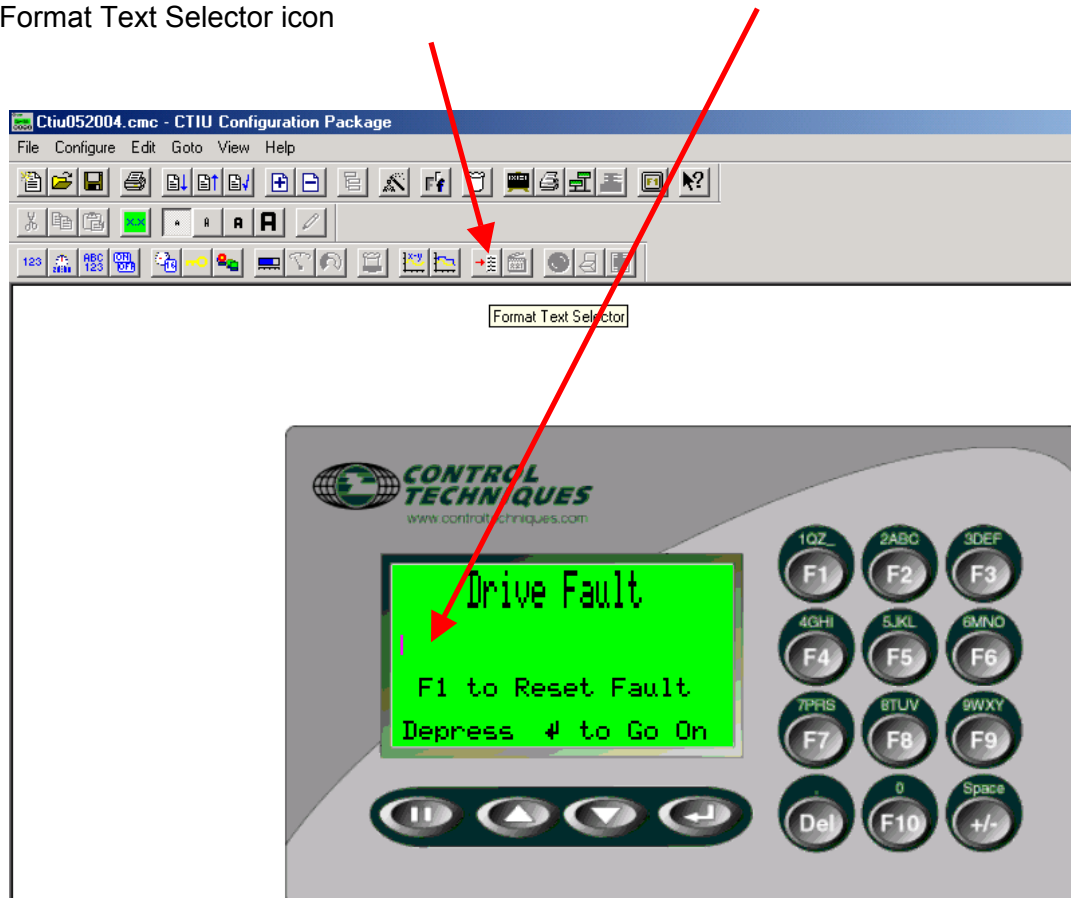
However, to save you time I've already created a Fault List file that can be imported to save you all this time.

The phrases that will pop up will be:

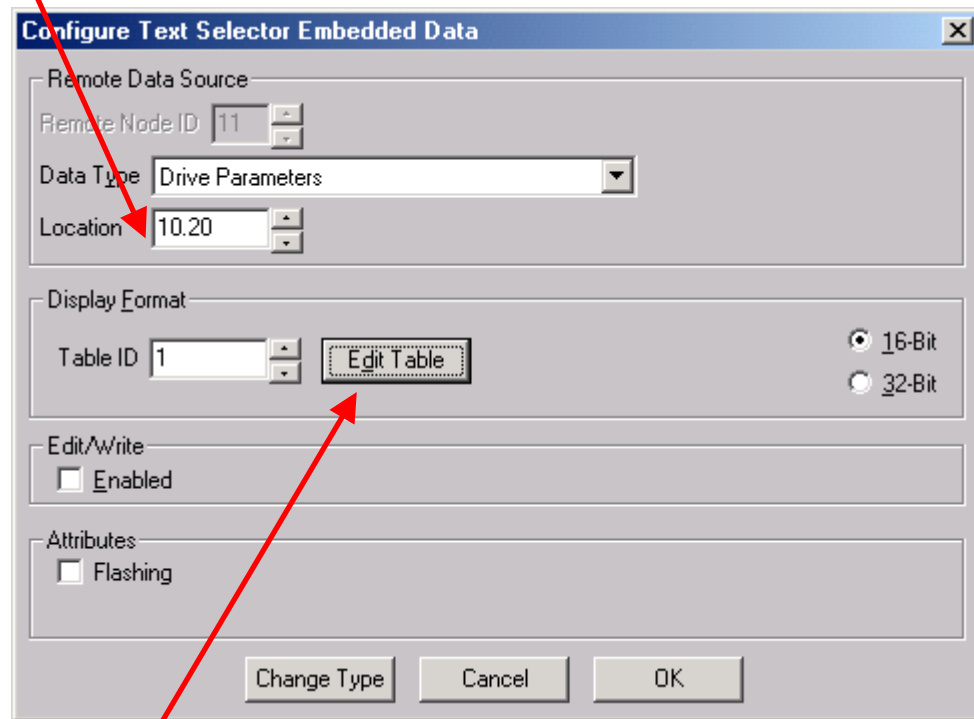
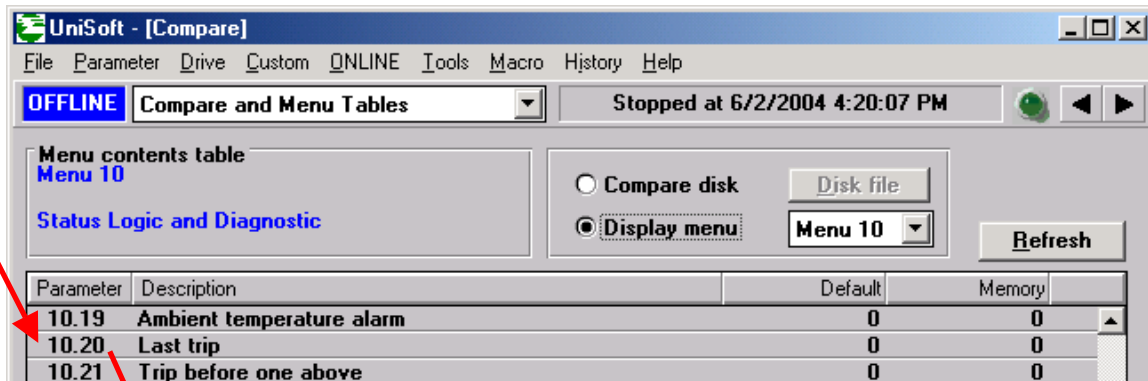
000 : Unknown Trip Code	053 : DPL Program Wrong 53
001 : DC Bus UnderVoltage	054 : DPL Task Overrun 54
002 : DC Bus OverVoltage	055 : RS485 Comms Trip 55
003 : AC OverCurrent Trip	056 : Fieldbus or Wrong OS
004 : Braking Overcurrent	057 : Illegal OS Call 57
005 : Internal Supply Trip	058 : Internal Error 58
006 : External Trip Pin 30	059 : Internal Error 59
007 : Motor Overspeed Trip	060 : CTNet Hardware 60
008 : Co-Processor Trip	061 : CTNet Baud/Node Err
009 : Resolver/SmallOption	062 : CTNet Baud Conflict
010 : Encoder Supply Trip	063 : CTNet Duplicate Node
011 : U Channel Problem	064 : Illegal Cyclic Rate
012 : V Channel Problem	101 : Uni5 OverTemperature
013 : W Channel Problem	102 : HeatSink Hot Unit 1
014 : UVW Connections ??	103 : HeatSink Hot Unit 2
015 : A Channel Problem	104 : HeatSink Hot Unit 3
016 : B Channel Problem	105 : HeatSink Hot Unit 4
017 : Connections-AB PH7	106 : HeatSink Hot Unit 5
018 : Encoder Failure-PH8	107 : HeatSink Hot Unit 6
019 : Braking Overload	108 : HeatSink Hot Unit 7
020 : Ixt Overload Trip	109 : HeatSink Hot Unit 8
021 : Heatsink (Ixt)-Oh1	110 : PowerSupply Unit 1
022 : Drive was Hot! Oh2	111 : PowerSupply Unit 2
023 : Electronics was Hot!	112 : PowerSupply Unit 3
024 : Motor was Hot!	113 : PowerSupply Unit 4
025 : MotorThermistor Bad	114 : PowerSupply Unit 5
026 : Drive 24v Overloaded	115 : PowerSupply Unit 6
027 : mA Current Ref1 Loss	116 : PowerSupply Unit 7
028 : mA Current Ref2 Loss	117 : PowerSupply Unit 8
029 : mA Current Ref3 Loss	118 : OverCurrentAC Unit 1
030 : Communication Loss	119 : OverCurrentAC Unit 2
031 : Data EEPROM Failure	120 : OverCurrentAC Unit 3
032 : AC Input Phase Loss	121 : OverCurrentAC Unit 4
033 : Stator ohms range ?	122 : OverCurrentAC Unit 5
034 : Uni 5 Spurious Trip	123 : OverCurrentAC Unit 6
035 : SOM Enc Comms failed	124 : OverCurrentAC Unit 7
036 : SOM Encoder Fault	125 : OverCurrentAC Unit 8
037 : UD78 is not present?	126 : DCOverVoltage Unit 1
041 : No Such Parameter-41	127 : DCOverVoltage Unit 2
042 : Write to Read Only42	128 : DCOverVoltage Unit 3
043 : Parameter Write Only	129 : DCOverVoltage Unit 4
044 : Value OverRange 44	130 : DCOverVoltage Unit 5
045 : IObox Link Failure ?	131 : DCOverVoltage Unit 6
046 : Stack Overflow 46	132 : DCOverVoltage Unit 7
047 : Internal Error 47	133 : DCOverVoltage Unit 8
048 : Internal Error 48	134 : DCOverCurrent Unit 1
049 : Wrong OS Loaded 49	135 : DCOverCurrent Unit 2
050 : Divide by 0 Math 50	136 : DCOverCurrent Unit 3
051 : Array Range Error 51	137 : DCOverCurrent Unit 4
052 : Control Word Trip 52	138 : DCOverCurrent Unit 5

139 : DCOverCurrent Unit 6	152 : Configuration Unit 3
140 : DCOverCurrent Unit 7	153 : Configuration Unit 4
141 : DCOverCurrent Unit 8	154 : Configuration Unit 5
142 : Unknown Fault Unit 1	155 : Configuration Unit 6
143 : Unknown Fault Unit 2	156 : Configuration Unit 7
144 : Unknown Fault Unit 3	157 : Configuration Unit 8
145 : Unknown Fault Unit 4	180 : Small Module Missing
146 : Unknown Fault Unit 5	181 : Servo Phasing Wrong?
147 : Unknown Fault Unit 6	182 : UD55 Memory Corrupt?
148 : Unknown Fault Unit 7	183 : No Cloning Data ??
149 : Unknown Fault Unit 8	184 : Wrong Drive Type
150 : Configuration Unit 1	185 : UD55 is Read only ?
151 : Configuration Unit 2	186 : Co-Processor Missing
	187 : Menu 20 Data Missing
	188 : Cloning Conflict ?

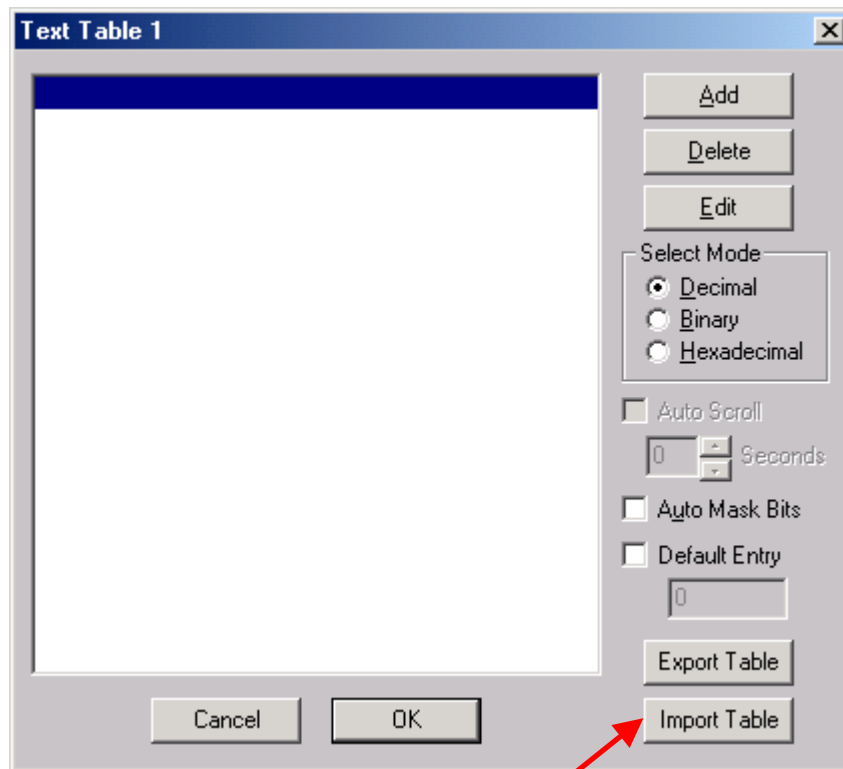
Place the cursor on the line where you want the Fault Phrase to appear then click on the Format Text Selector icon



Parameter #10.20 in the Unidrive will indicate the Fault Code of the last trip. We would want to decode that into a text phrase.

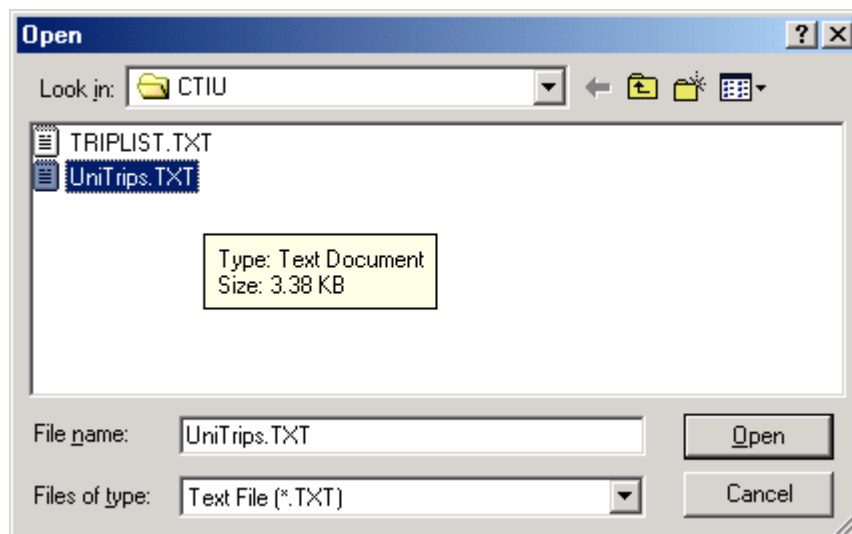


Now click on EDIT TABLE

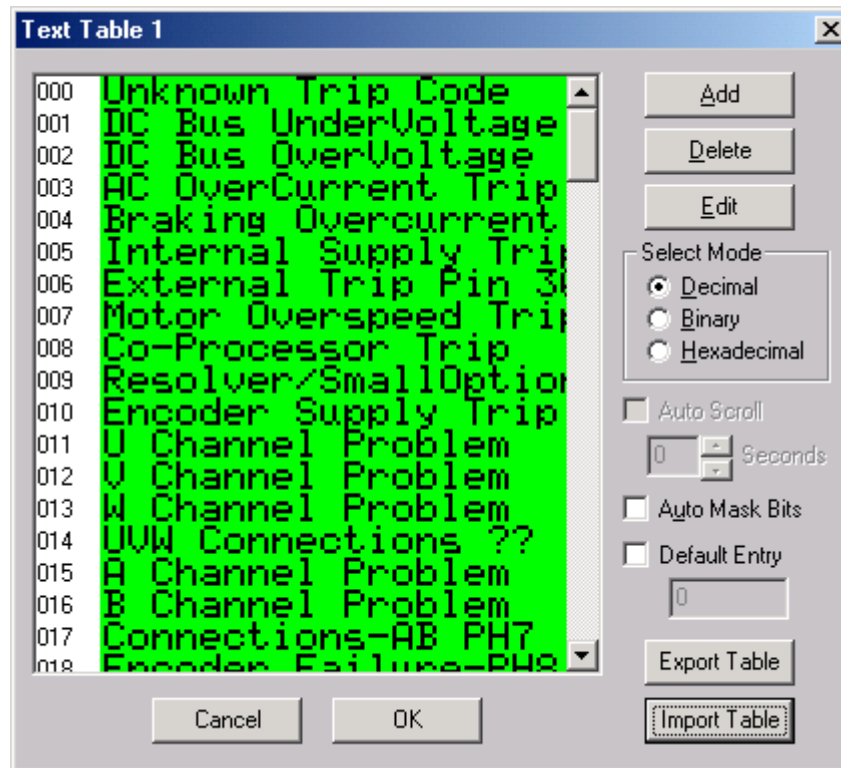


Now click on IMPORT TABLE

The Fault Trip list can be imported from a text file named **UniTrips.txt**



This should pull in a proper text phase for each Unidrive fault. Click OK after this.

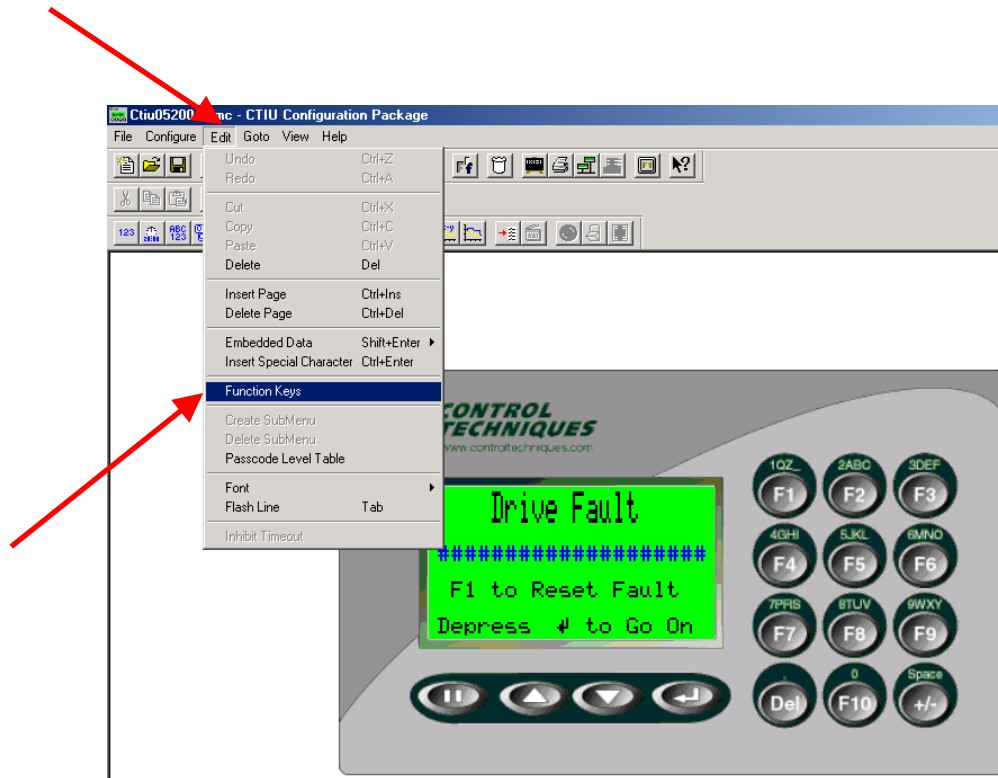


Now your Fault Screen should look as shown below:

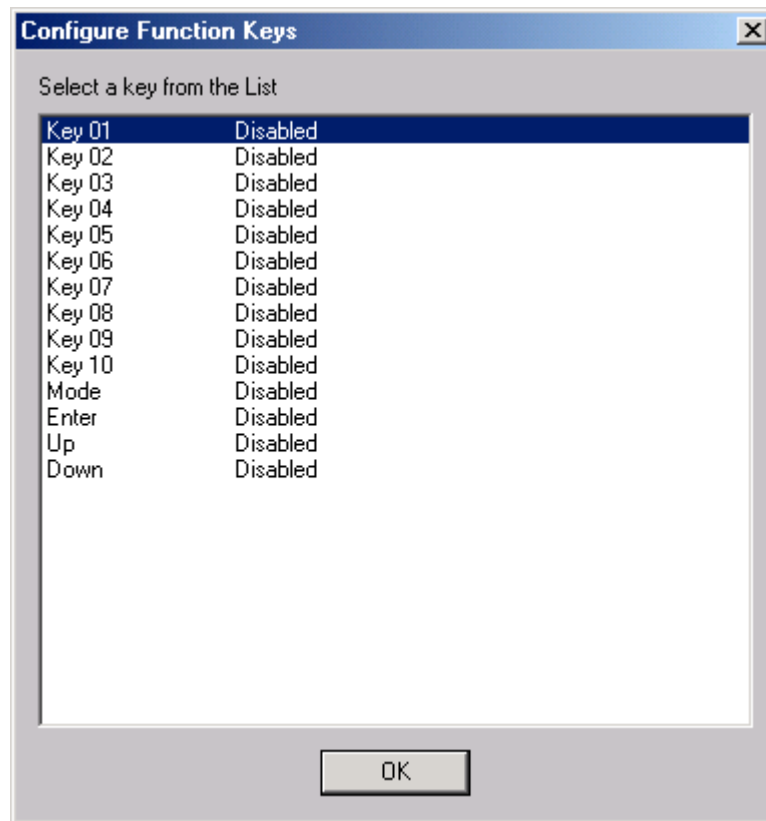


Remote Fault Reset

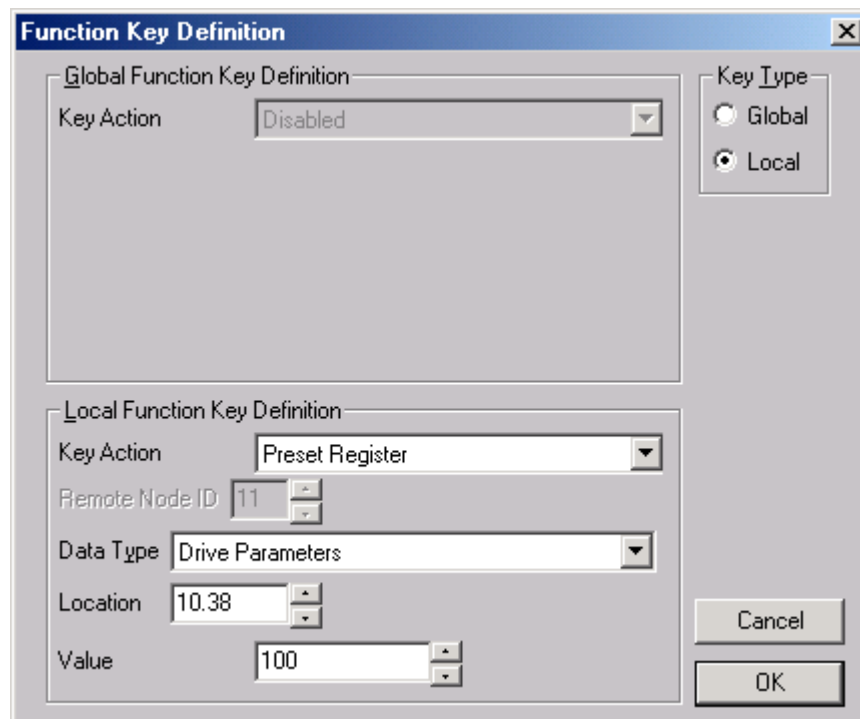
If you wish to Reset the fault from the CTIU, this can be accomplished by assigning a key to write a Reset command to the Unidrive.



Double click on the selected key you choose for Reset.



Set up the key as follows:



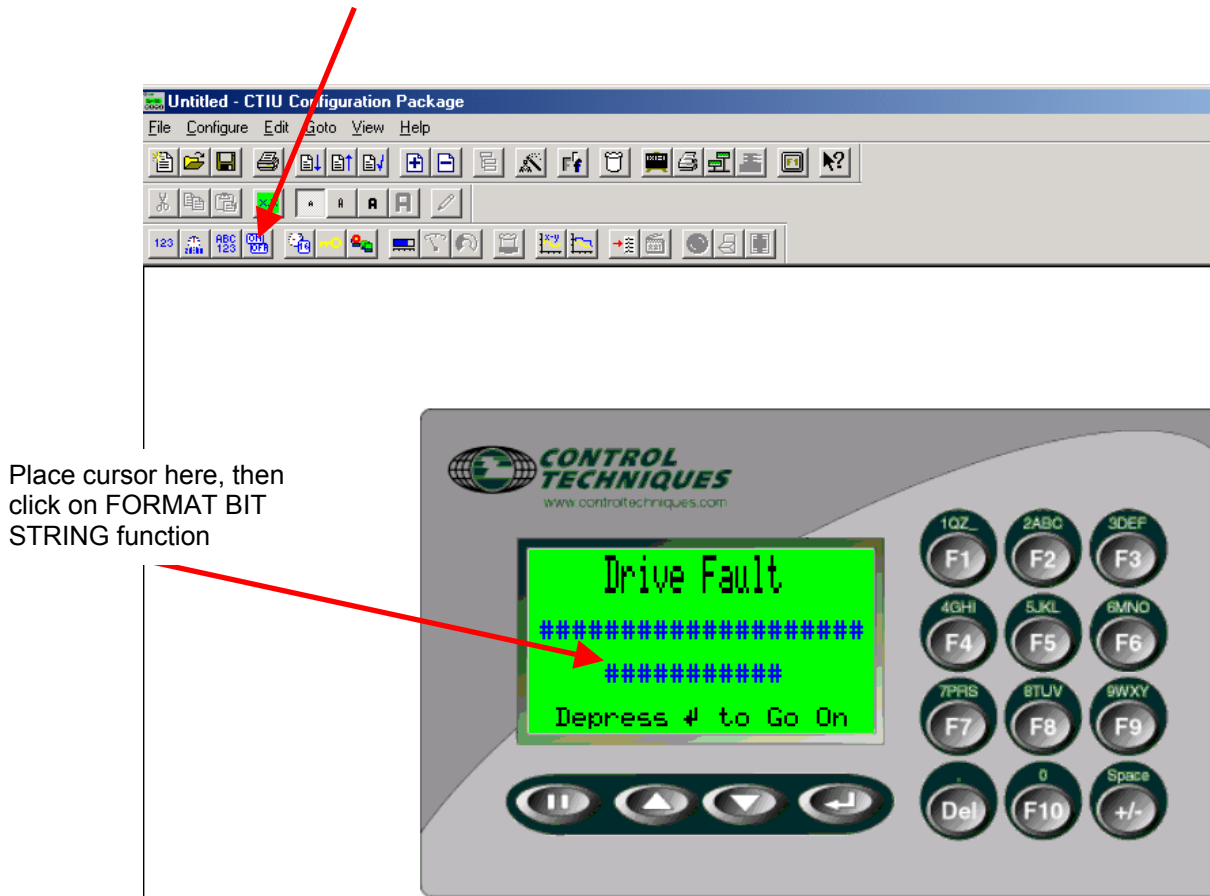
Testing

If you wish to test this, make a Main Customer screen on Page 1 and perhaps another screen on page 2. Cause a drive fault by going to #10.38 and enter 10 for instance. The Alarm screen should appear for trip 10 (**Encoder Supply Trip**)

Try the Remote Reset by depressing the F1 key.

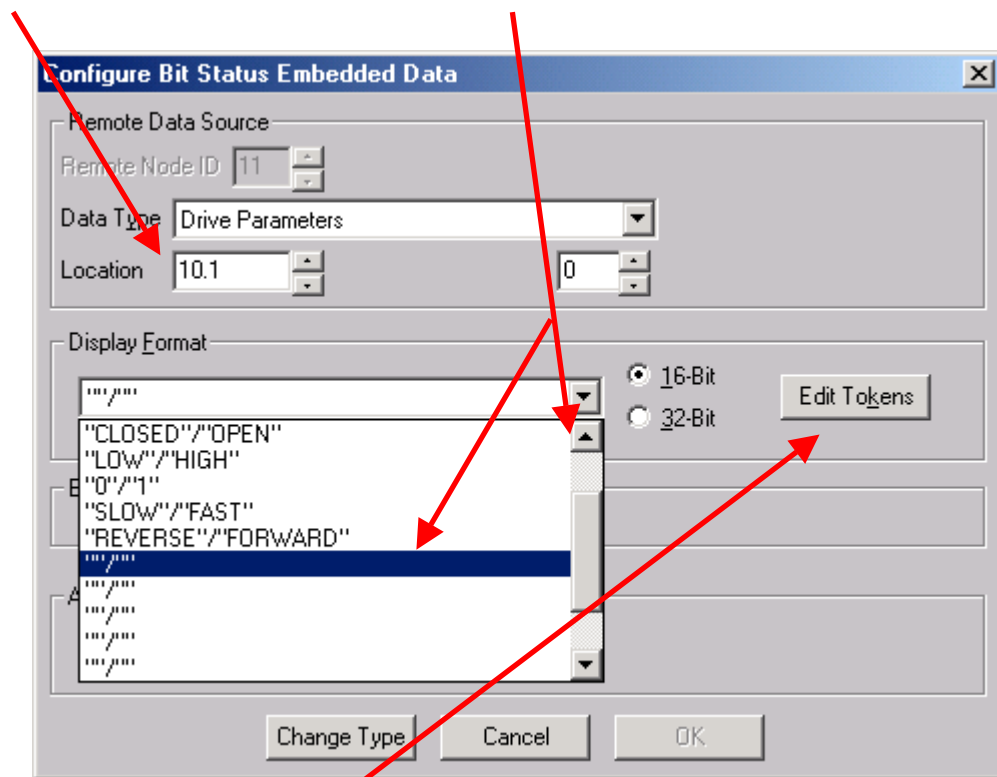
Embellishment

A small but nice embellishment to the Fault screen would be to change the message about **"Depress F1 to Reset the Fault"**. This would be nicer if it would indicate to the user that his F1 closure had indeed reset the Fault. To accomplish this we could use the FORMAT BIT STRING function



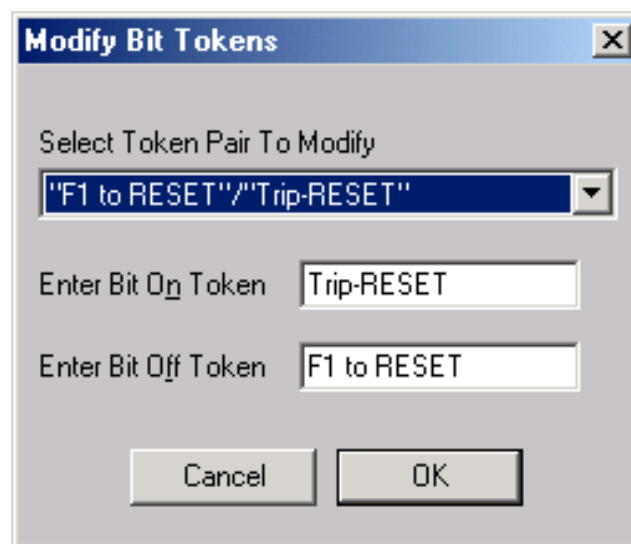
Set to Drive Healthy Bit

then scroll down to an un-assigned phrase



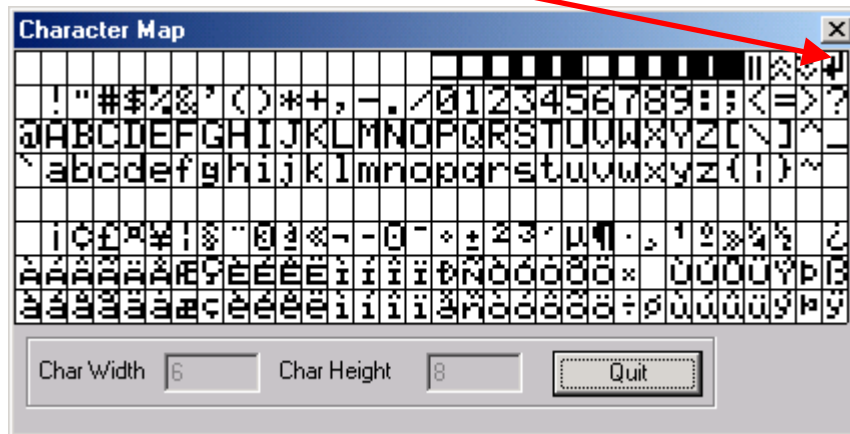
Then click on EDIT TOKENS

Modify as follows:





By the way, to get this special character, go to EDIT and select INSERT SPECIAL CHARACTER.



Summary

An example file for a CTIU110 is available from our website within the Application Note Area under Application Notes for AC Drives/Unidrive **CTAN246**.

This application note outlined a method to accomplish the requirement without using internal programming. We could also have written a short program within the Math section of the CTIU. Note however that the CTIU50 does not support Math functions.

A more eloquent example of this same kind of function is illustrated in **CTAN248** where a small program is created using the Math functions of the CTIU.

Other applicable Application Notes

CTAN245 Creating Power Up Splash Screen

CTAN247 Creating a Fault History Screen

CTAN248 Creating Unidrive Fault Screen using Maths



Questions ?? Ask the Author:

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