

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

Creating a Unidrive PopUp Fault Screen with the CTIU Operator Interface Unit

It is often desirable to offer a special Fault Screen on an HMI Operator Interface Unit that just pops up upon a Drive Fault. Many of the CTIU's have the ability to follow instructions within the programmable Math area. A conditional Fault screen could be created to appear on the event of a Fault and other logic can be created to allow the Fault to be acknowledged and permit one to RESET the drive fault remotely via the CTIU.



This application note will outline a procedure to allow you to create a Fault Screen such as the one shown above 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:

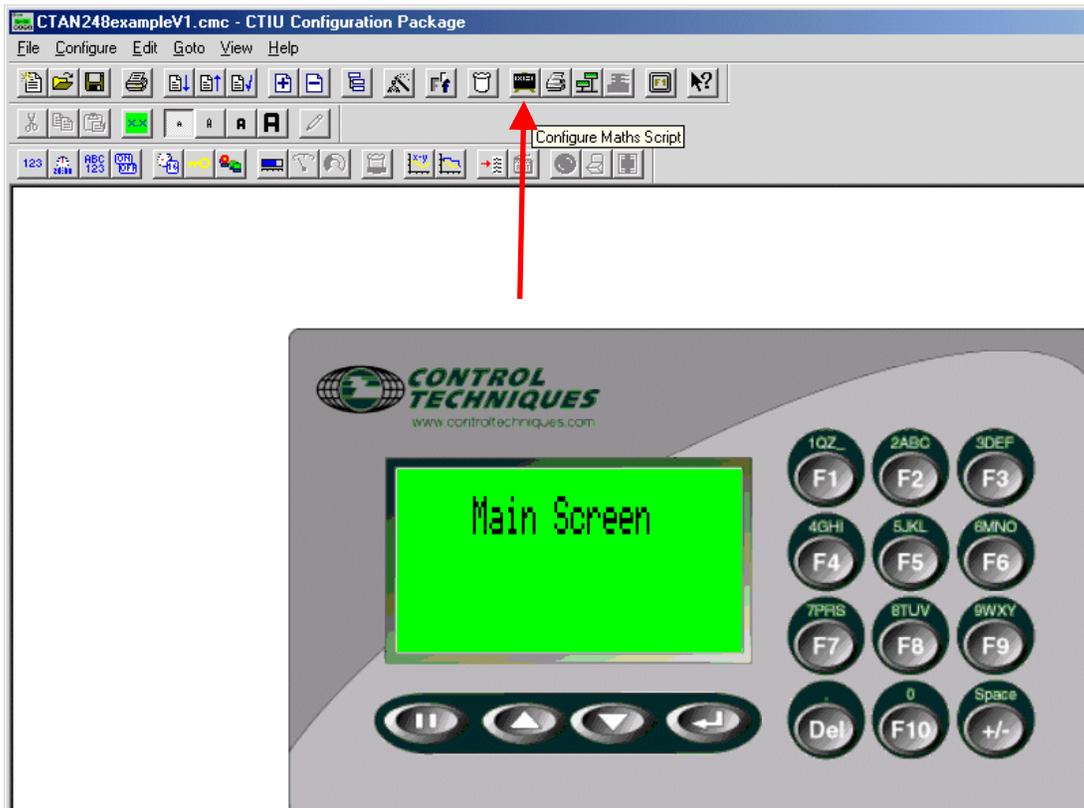
http://www.emersonct.com/download_usa/software_drives.htm

This method will not use the Alarm function as outlined in CTAN246 but rather utilize the Math area to create a short program to accomplish the function. The advantage to this method is that nothing special has to be programmed in the drive to allow this function to occur. The disadvantage is that it cannot be done using the CTIU 50 series – in this case you would consult CTAN246.

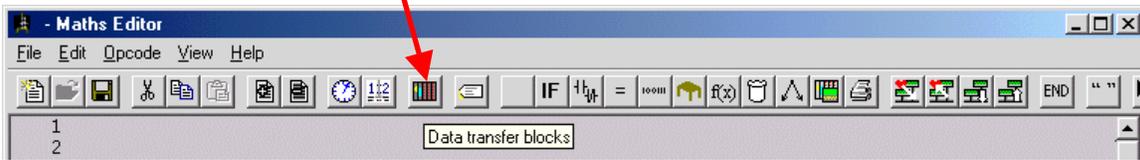
Creating a Program in the Math Area

First you must develop a strategy. What we need is a method to monitor the Drive Healthy bit (#10.01) to determine when a fault occurs. Parameter bit #10.01 will become 0 when a Fault occurs. There is a feature in the Math area that can Map AE (automated equipment) such as our Drive data into CTIU registers.

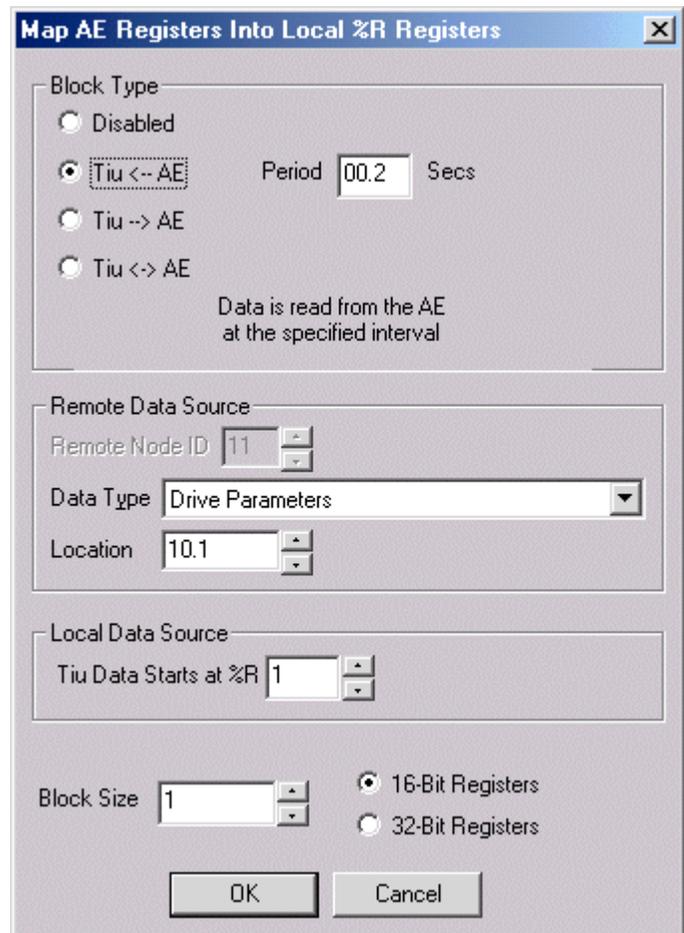
To set this automatic transfer up click on the Math function icon as shown below:



Then click on the Data Transfer icon:

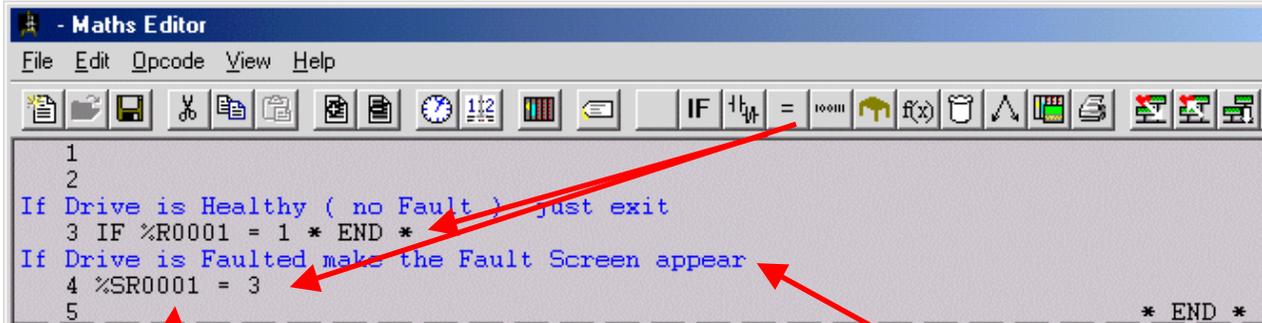


Double click on mapping for %R0001 which will cause this properties dialog box to pop-up.



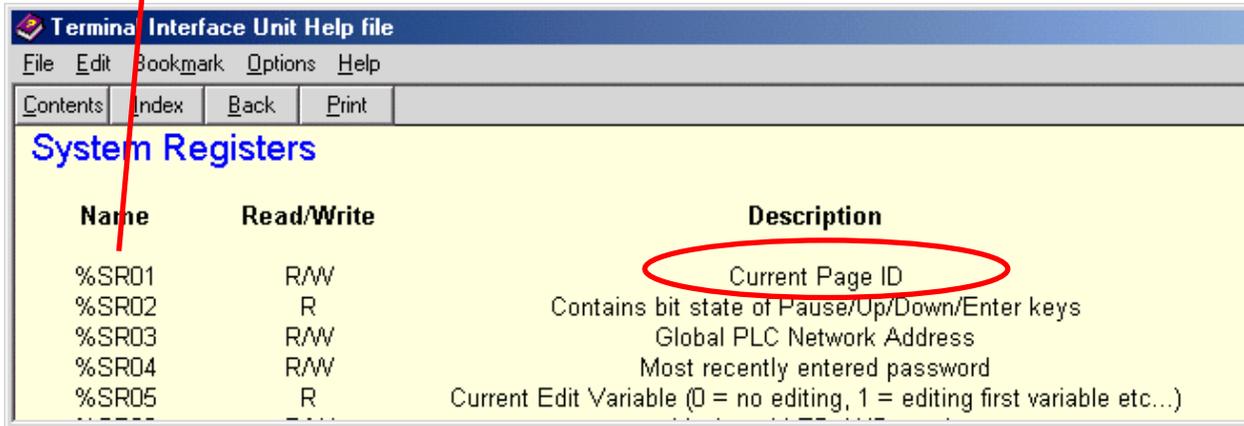
Then, set up internal Register 1 to scan the drive (parameter #10.01) every 0.2 seconds as follows:

Now we can start creating code:



```
1
2
3 If Drive is Healthy ( no Fault ) just exit
4 IF %R0001 = 1 * END *
5 If Drive is Faulted make the Fault Screen appear
6 %SR0001 = 3
7
8 * END *
```

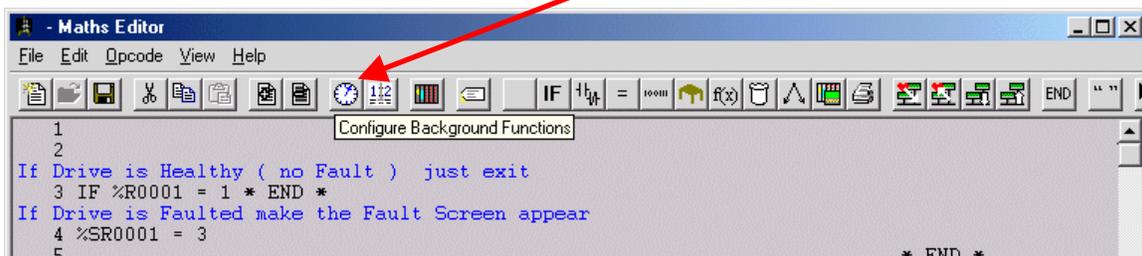
Comment



Name	Read/Write	Description
%SR01	RAW	Current Page ID
%SR02	R	Contains bit state of Pause/Up/Down/Enter keys
%SR03	RAW	Global PLC Network Address
%SR04	RAW	Most recently entered password
%SR05	R	Current Edit Variable (0 = no editing, 1 = editing first variable etc...)

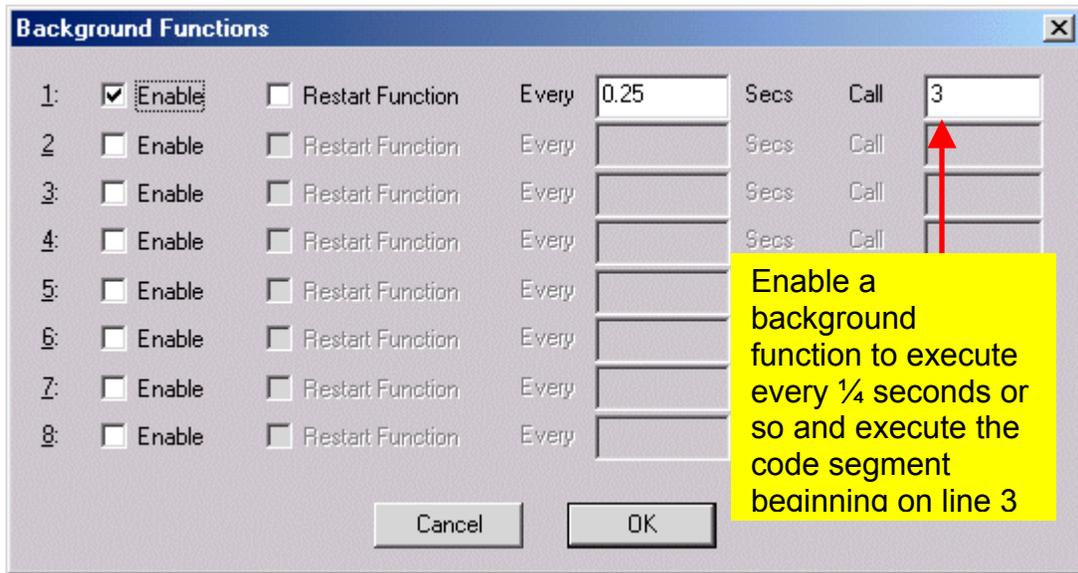
So, if we can get this small bit of code to execute periodically, it will check the Drive Healthy bit and exit if the Drive is ok. But if a fault occurs, it will make the display screen page 3 appear which is our Fault screen.

To make this code execute automatically click on the Background task icon:



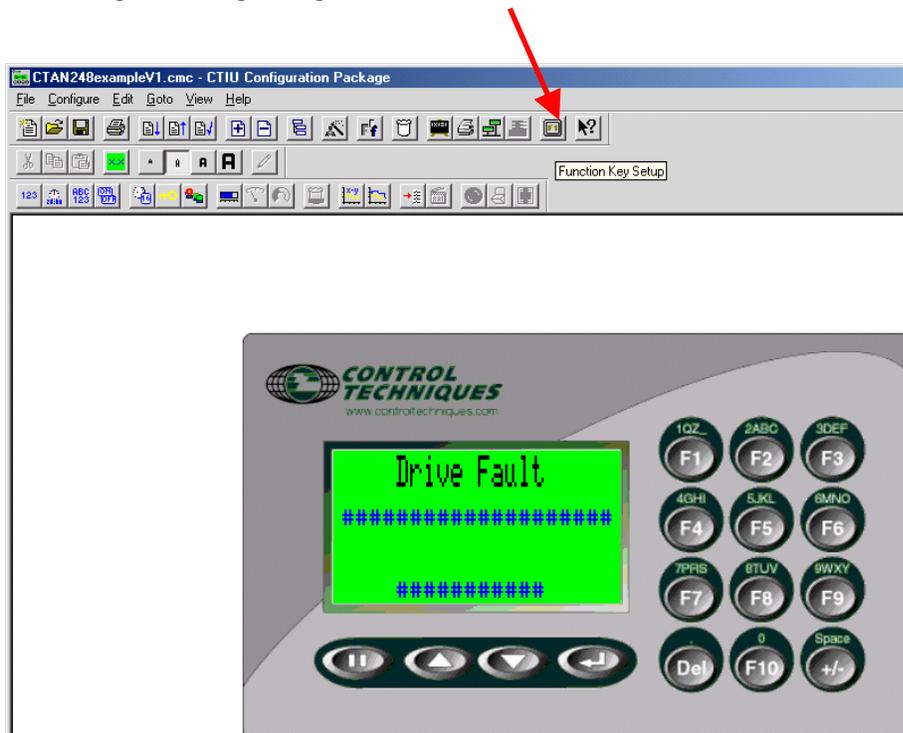
```
1
2
3 If Drive is Healthy ( no Fault ) just exit
4 IF %R0001 = 1 * END *
5 If Drive is Faulted make the Fault Screen appear
6 %SR0001 = 3
7
8 * END *
```

Then fill out as follows:

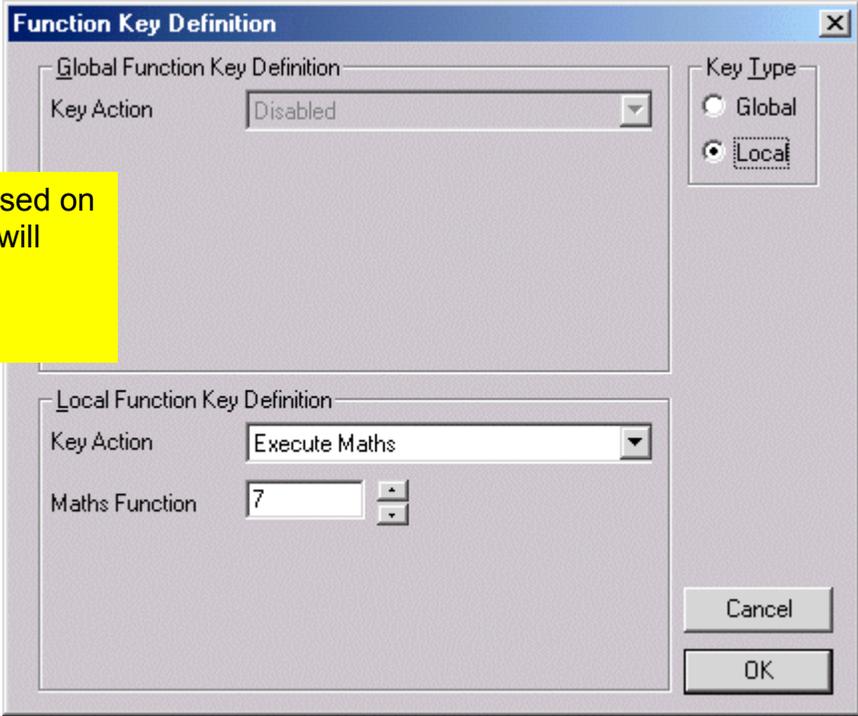


Once the Fault screen appears, it would be ideal if we had a message to tell the Operator to depress a key (say F1) to signal that the Operator has acknowledged the Fault and wishes to Reset the Fault. After the Fault has been reset, the display should be sent back to the normal power up screen – probably page 1.

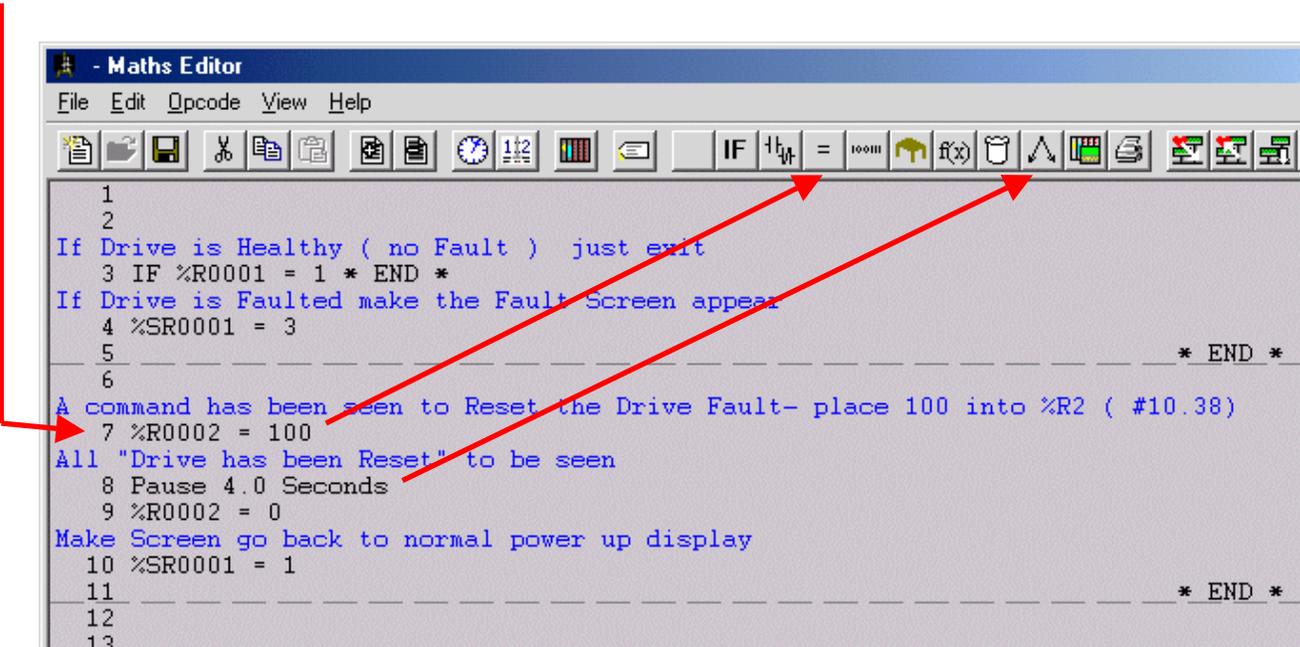
To accomplish this function, we need to be on our Fault Screen and program the F1 key to execute a code segment beginning on a line of our choice.



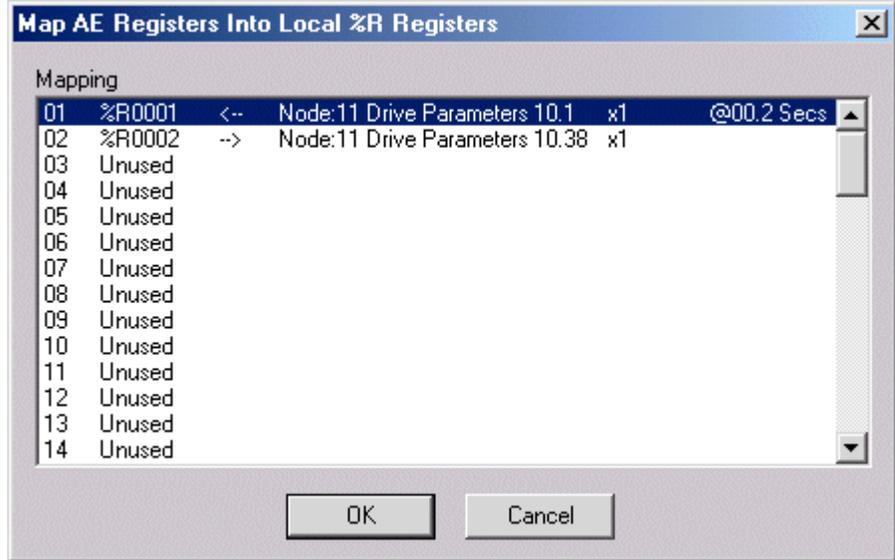
When the F1 key is depressed on this Local Fault Screen, it will Execute a code segment beginning on line 7



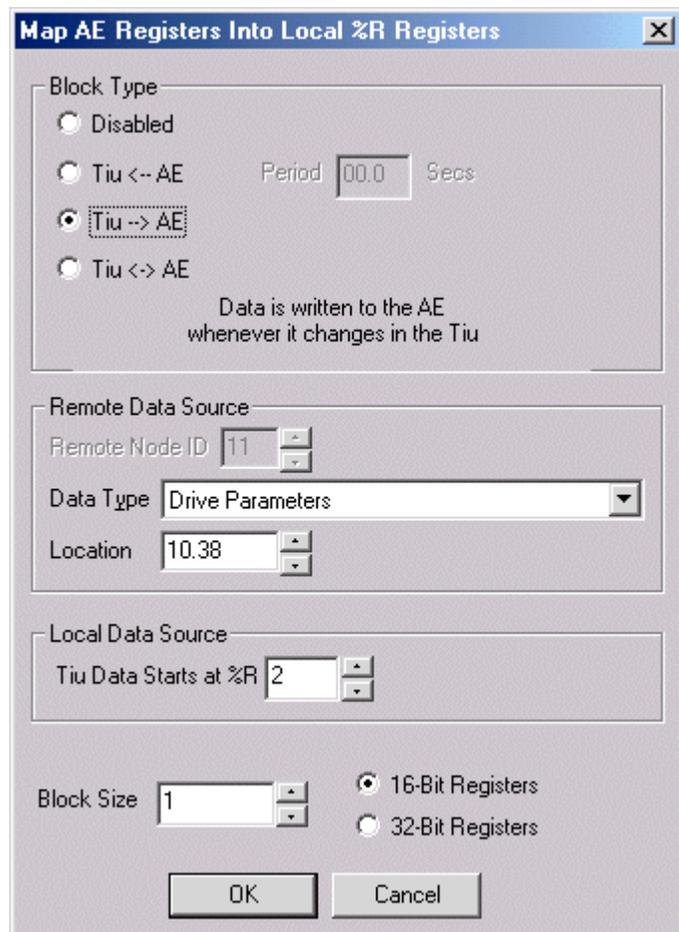
On line 7 we will set an Internal CTIU register with a value to cause the Drive to Reset. Drive Reset can be accomplished serially by writing 100 to #10.38.



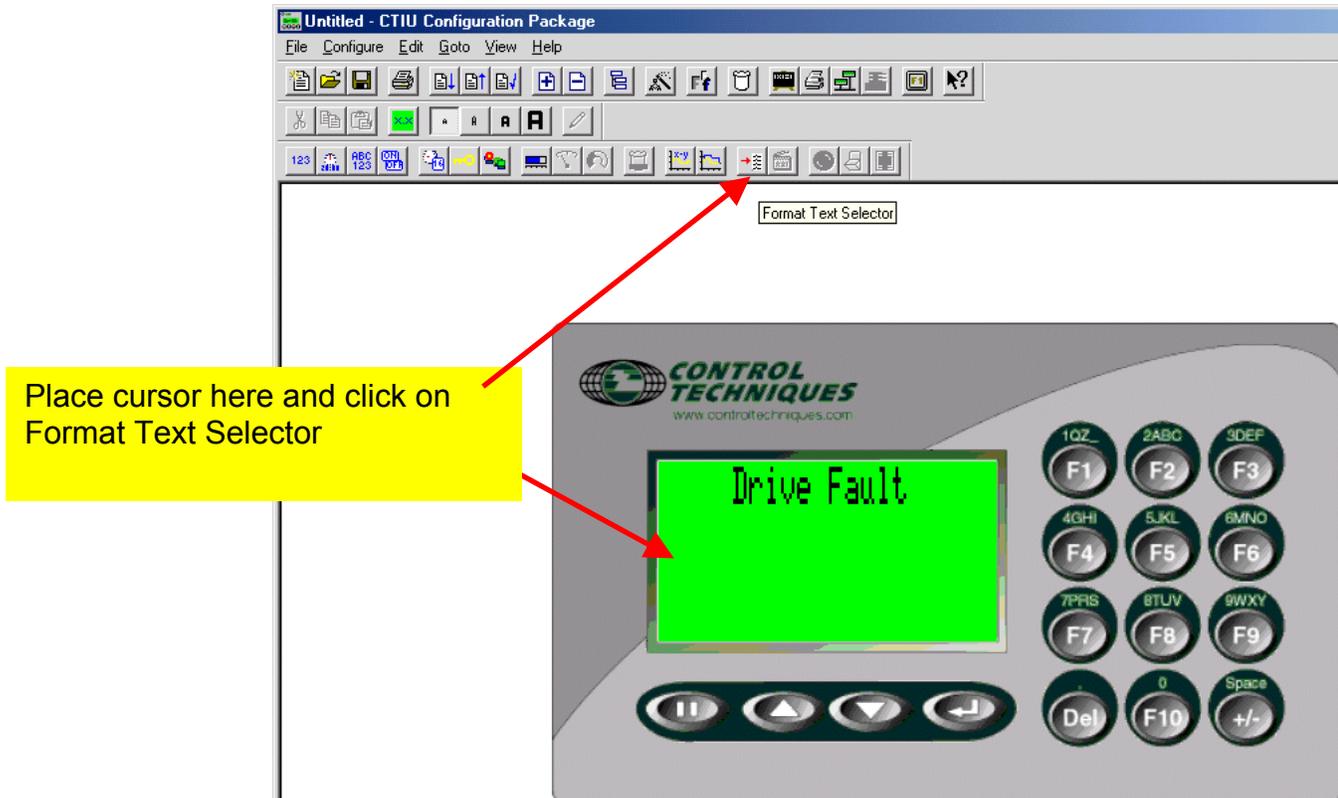
Now that we have placed a 100 into %R0002 of the CTIU, we need to have it sent to the Drive.



Double click on %R0002 mapping and fill out as follows:



One could now create a screen similar to that shown below and a line where the Fault Message is to appear:



Place the cursor on the line where you want the Fault Phrase to appear then click on the Format Text Selector icon. This function will permit you to create a phase for each fault to be displayed.

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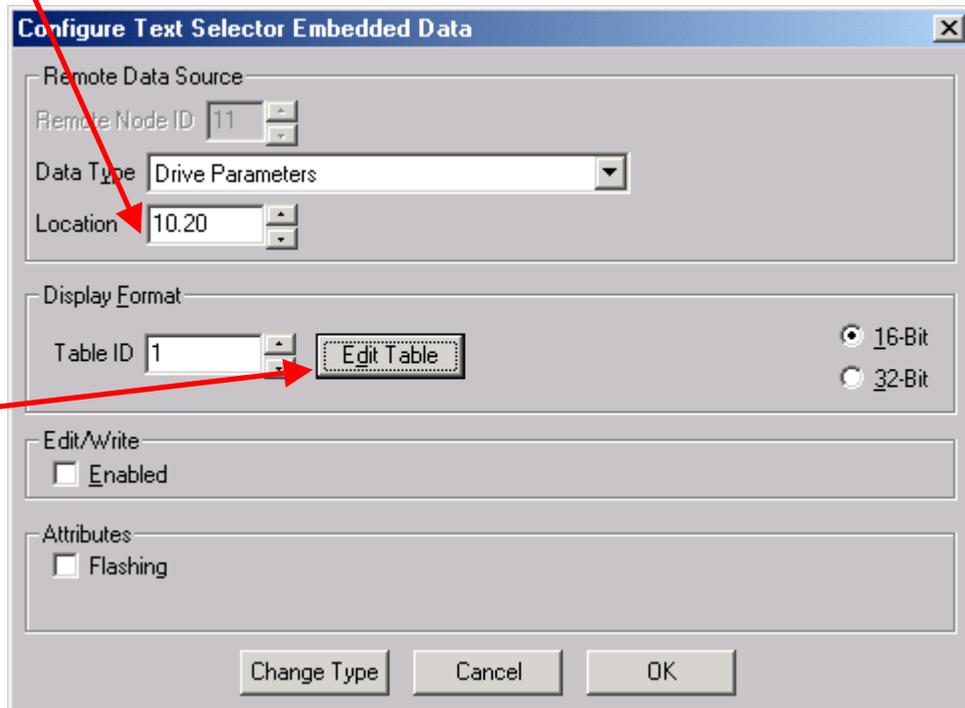
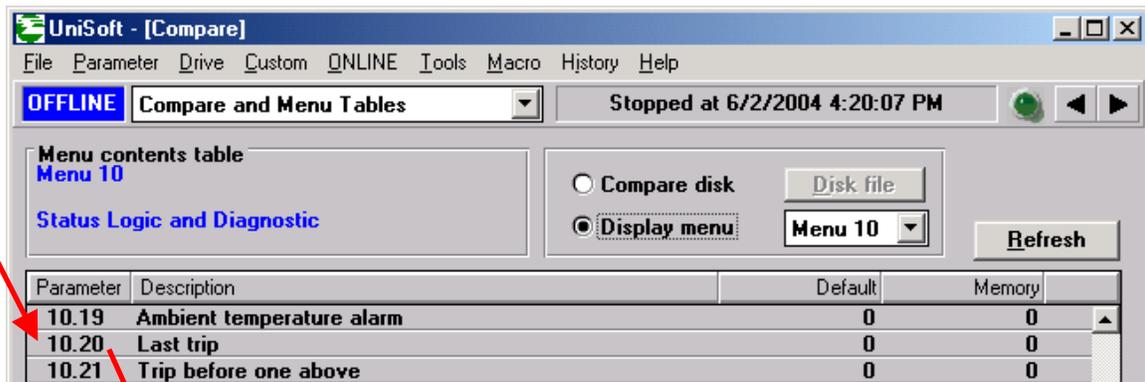
However, to save you time I've already created a Fault List file that can be imported to save you all this time.

The phrases that will pop up will be:

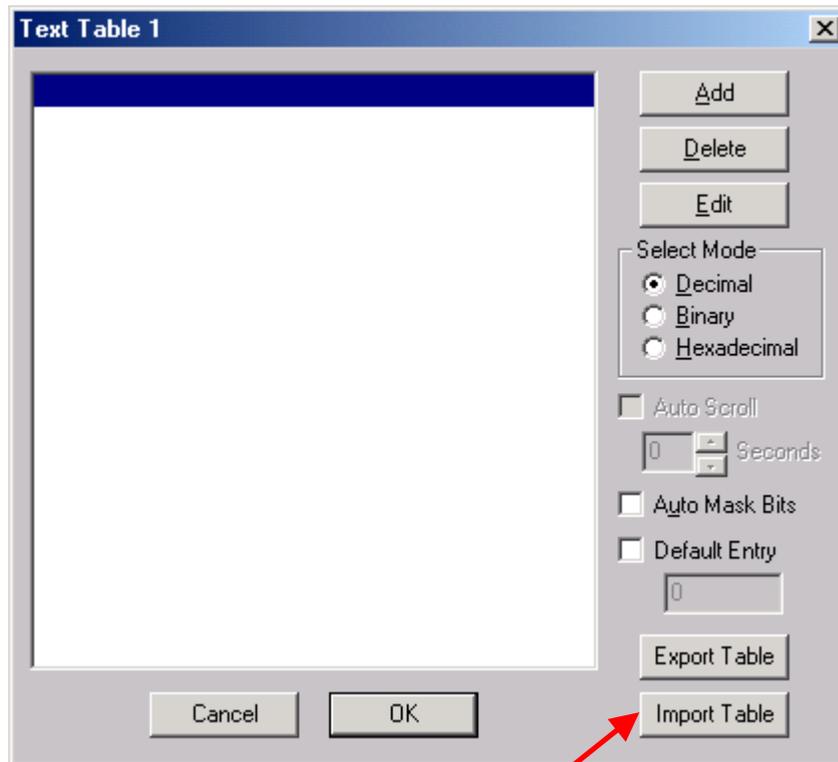
000 : Unknown Trip Code	053 : DPL Program Wrong 53
001 : DC Bus UnderVoltage	054 : DPL Task Overrun 54
002 : DC Bus OverVoltage	055 : RS485 Comms Trip 55
003 : AC OverCurrent Trip	056 : Fieldbus or Wrong OS
004 : Braking Overcurrent	057 : Illegal OS Call 57
005 : Internal Supply Trip	058 : Internal Error 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 ?

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.

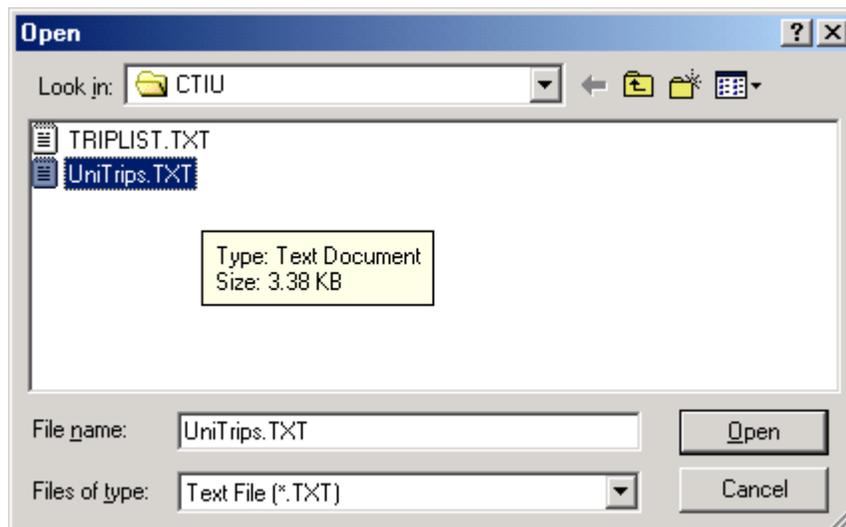


This will cause the table editor to pop up:

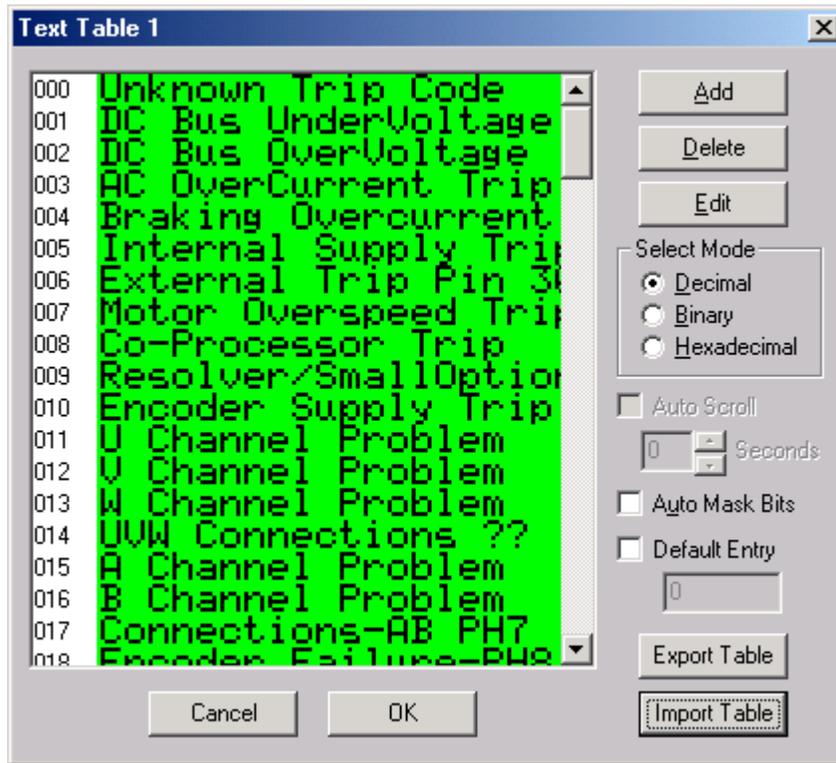


Now click on IMPORT TABLE

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:



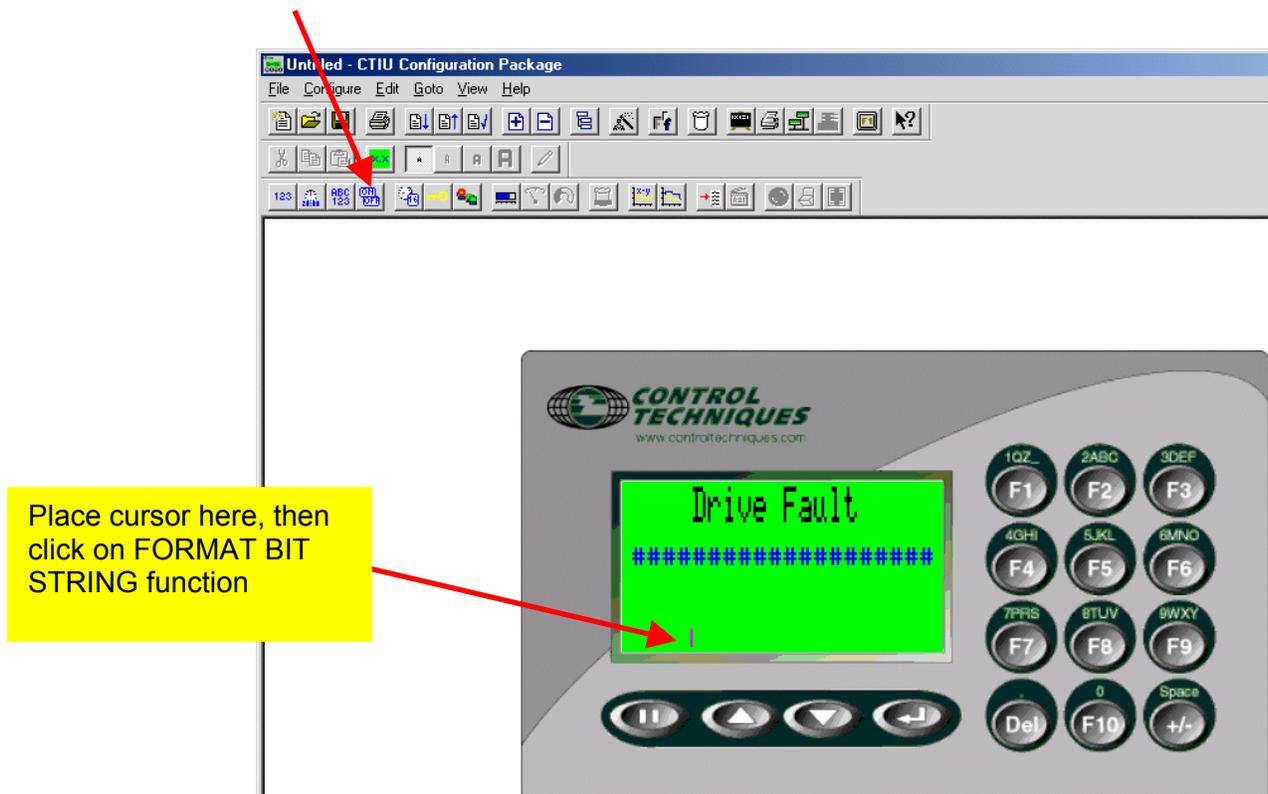
Remote Fault Reset

As previously configured, a Function key can be setup to Reset the fault from the CTIU. this can be accomplished by assigning a key to write a Reset command to the Unidrive.

Embellishment

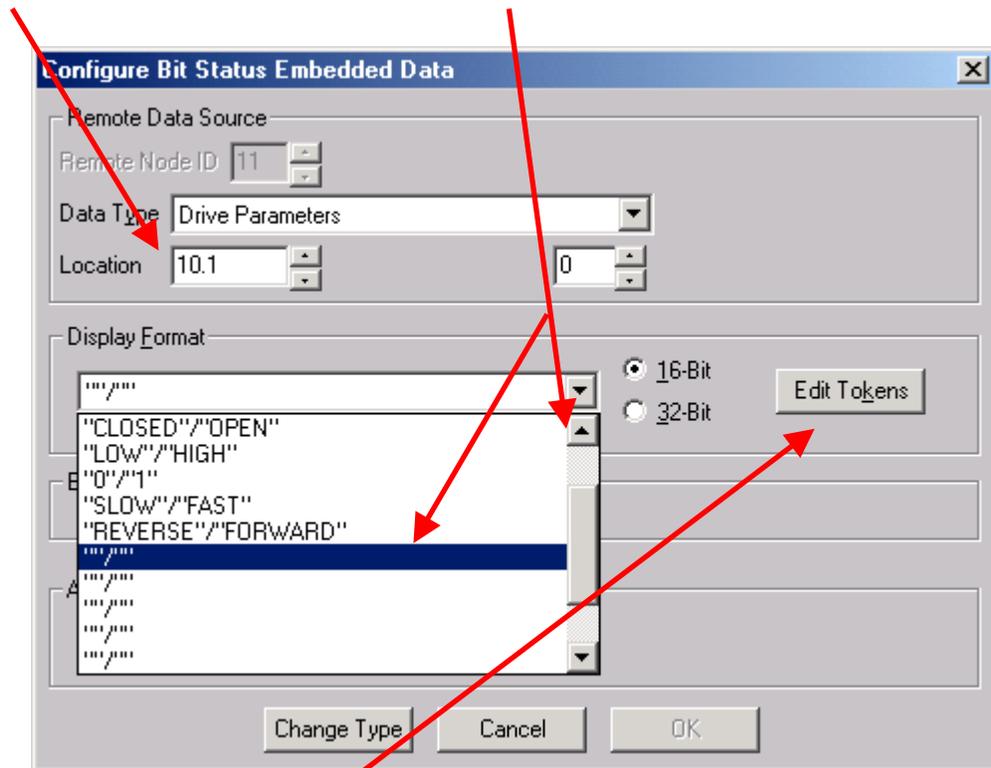
A small but nice embellishment to the Fault screen would be to create an instructional message such as “**Depress F1 to Reset the Fault**”. This would be nicer if it would indicate to the Operator that the F1 key was indeed pressed and RESET accomplished. Therefore, we would Format the bit string as follows:

FORMAT BIT STRING function



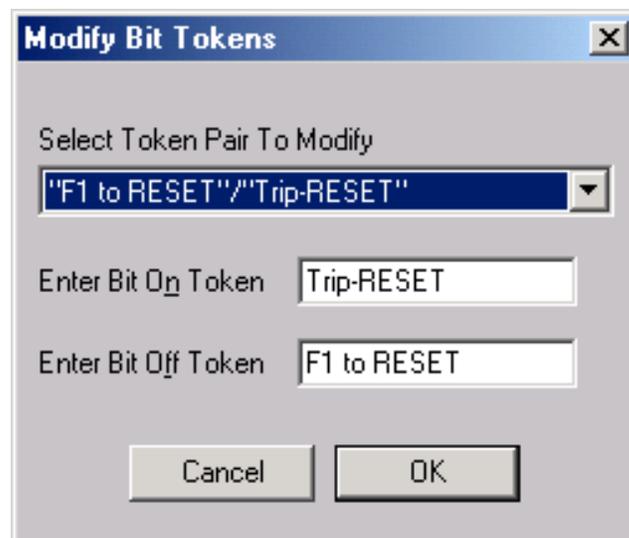
Set to Drive Healthy Bit

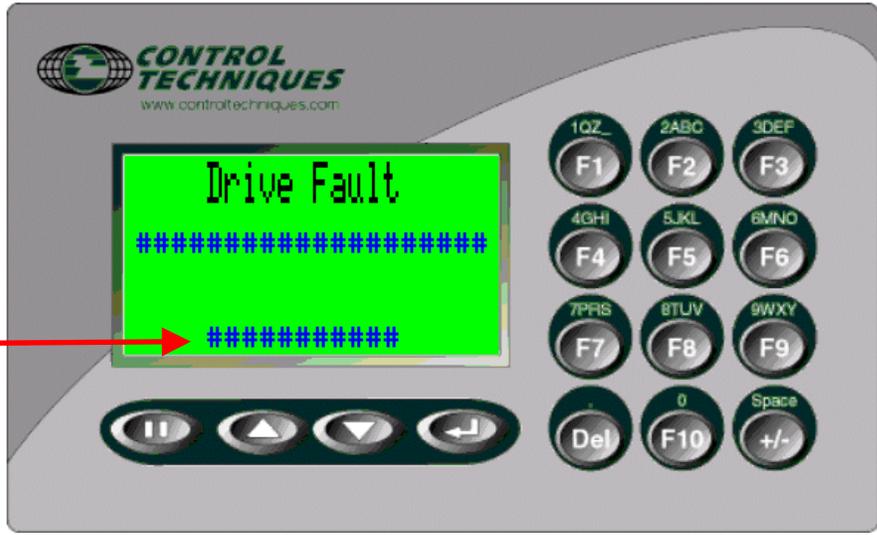
then scroll down to an un-assigned phrase



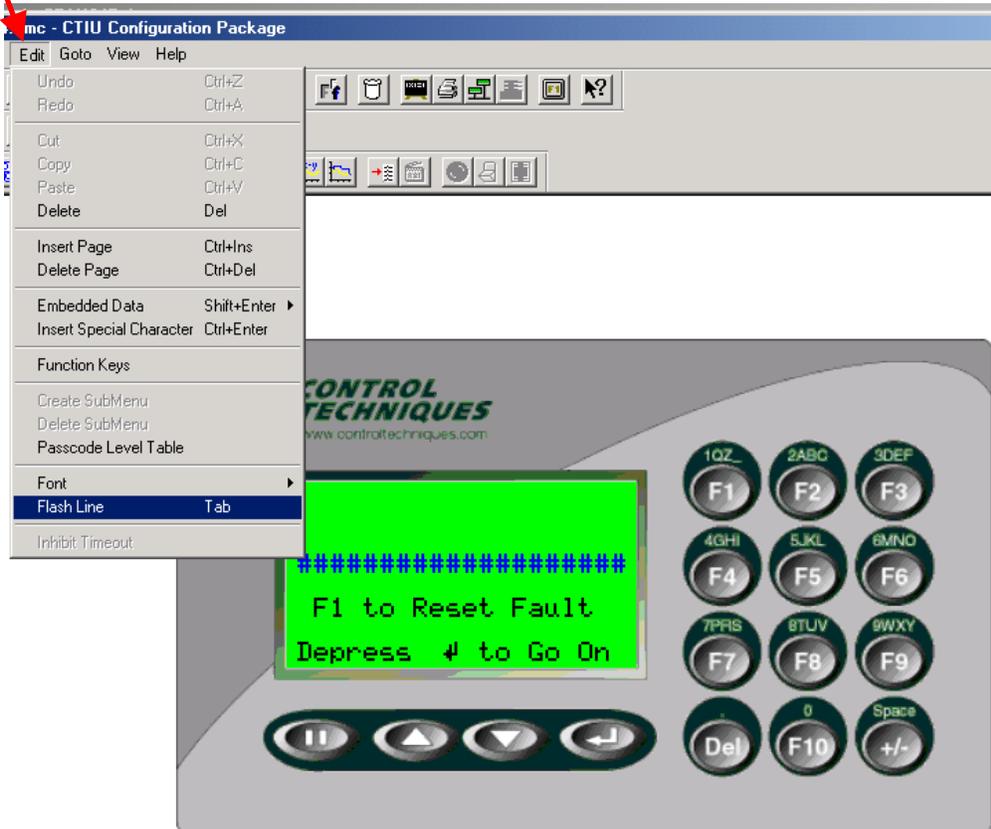
Then click on EDIT TOKENS

Modify as follows:





Perhaps Flash this line for more attention



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.

Summary

An example file for a CTIU110 is available from our website within the Application Note Area under Application Notes for AC Drives/Unidrive **CTAN248**.

This application note outlined a method to accomplish the requirement using internal programming. We could also have accomplished a similar function using features of the CTIU and of the Unidrive without using internal programming of the CTIU. Note however that the CTIU50 does not support Math functions.

Other applicable Application Notes

[CTAN245](#) Creating Power Up Splash Screen

[CTAN246](#) Creating Unidrive PopUp Fault Screen w/o using Maths

[CTAN247](#) Creating a Fault History Screen

Questions ?? Ask the Author:

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