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Universal Transmitter Signal Conditioner

Part 2 - Programming & Setup

VID: L-PROC-SC-002

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Application Example Recap

The following schematic shows the equipment and wiring example that was used in the first video in this series to convert one type of signal to another type of signal.

In our example, we have an RTD (resistance temperature detector) mounted on equipment that is used for reading a process temperature, such as a curing oven. The controller we have will not accept RTD inputs. It only has 0-5 VDC or 4-20 mA inputs, such as the CLICK PLC.

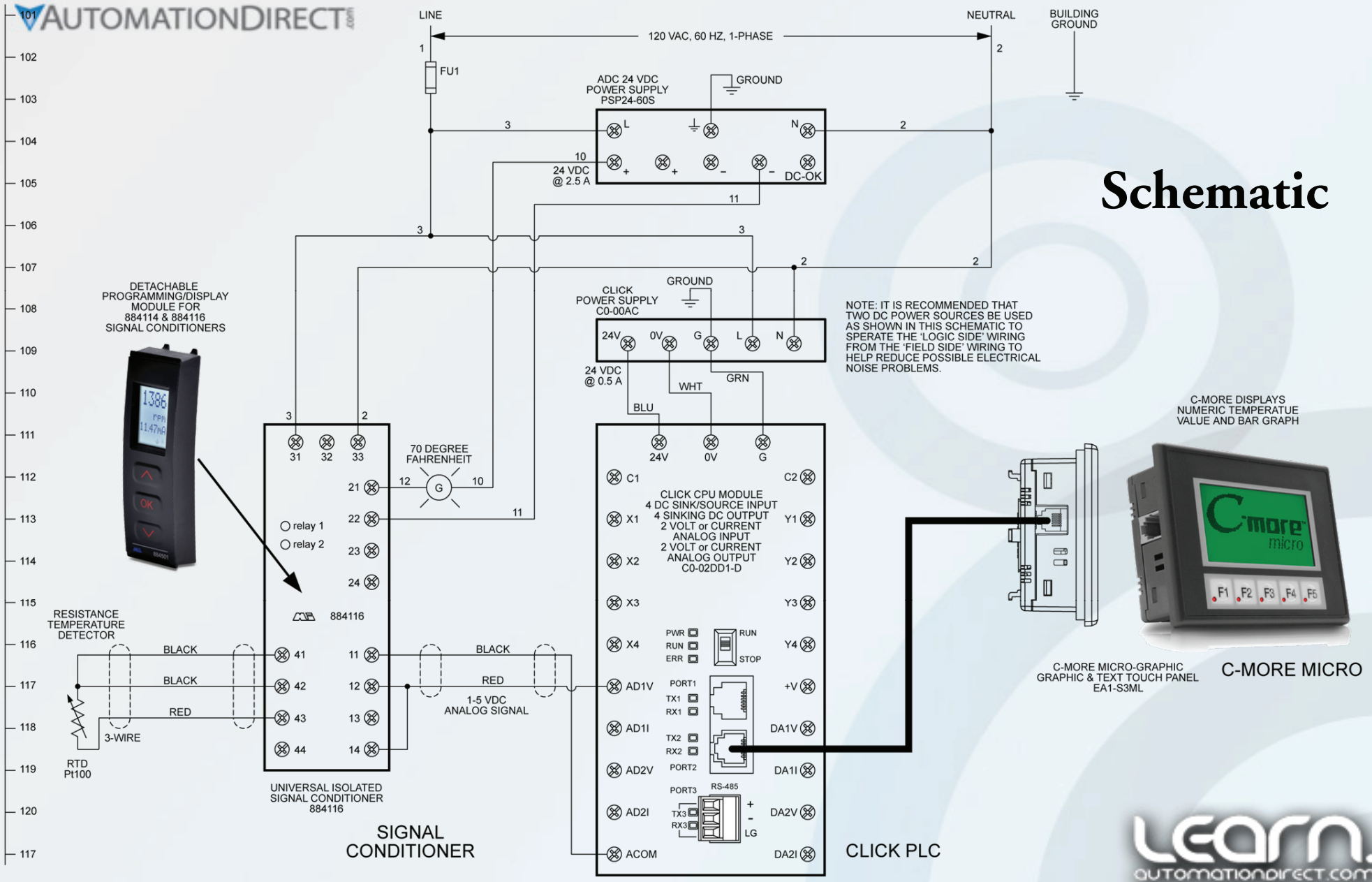
We can resolve the problem by taking the RTD, wire it into terminals 41-43 on the signal conditioner, setup the input of the signal conditioner for 3 wire RTD, then wire the output of the signal conditioner to the analog input of the CLICK PLC. We then set them both for a range of 1-5 VDC.

In the CLICK PLC we set the scaling of the analog input to read 0 to 100 degrees Fahrenheit, and also use a C-more Micro-Graphic panel to display the temperature, both as a numeric value and also as a bar graph indicator.

We also take advantage of the model 884116's relay contact output and use a set point of 70 degrees Fahrenheit to turn on an indicator pilot light.

The next step we need to do is program the Signal Conditioner.

Schematic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LINE
NEUTRAL
BUILDING GROUND
120 VAC, 60 HZ, 1-PHASE
FU1
ADC 24 VDC POWER SUPPLY PSP24-60S
GROUND
24 VDC @ 2.5 A
DC-OK
CLICK POWER SUPPLY C0-00AC
24V
0V
G
L
N
24 VDC @ 0.5 A
WHT
GRN
BLU
NOTE: IT IS RECOMMENDED THAT TWO DC POWER SOURCES BE USED AS SHOWN IN THIS SCHEMATIC TO SPERATE THE 'LOGIC SIDE' WIRING FROM THE 'FIELD SIDE' WIRING TO HELP REDUCE POSSIBLE ELECTRICAL NOISE PROBLEMS.
DETACHABLE PROGRAMMING/DISPLAY MODULE FOR 884114 & 884116 SIGNAL CONDITIONERS
70 DEGREE FAHRENHEIT
relay 1
relay 2
884116
RESISTANCE TEMPERATURE DETECTOR
BLACK
BLACK
RED
3-WIRE
RTD Pt100
1-5 VDC ANALOG SIGNAL
UNIVERSAL ISOLATED SIGNAL CONDITIONER 884116
SIGNAL CONDITIONER
CLICK CPU MODULE
4 DC SINK/SOURCE INPUT
4 SINKING DC OUTPUT
2 VOLT or CURRENT ANALOG INPUT
2 VOLT or CURRENT ANALOG OUTPUT
C0-02DD1-D
PWR
RUN
ERR
RUN
STOP
PORT1
TX1
RX1
PORT2
TX2
RX2
PORT3
RS-485
TX3
RX3
LG
AD1V
AD1I
AD2V
AD2I
ACOM
+V
DA1V
DA1I
DA2V
DA2I
CLICK PLC
C-MORE DISPLAYS NUMERIC TEMPERATUE VALUE AND BAR GRAPH
C-MORE MICRO-GRAPHIC GRAPHIC & TEXT TOUCH PANEL EA1-S3ML
C-MORE MICRO
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Programming the Signal Conditioner

The 884501 programming/display module is used for signal conditioner configuration and includes a 4-line LCD display. Line 1 shows the input signal, line 2 shows units, line 3 shows analog output or tag number, and line 4 shows communications and relay status. During configuration, line 3 also shows scrolling help text. The messages on the display are abbreviated as shown on the next page. There are three buttons on the front of the unit; an 'OK', an 'Up' arrow, and a 'Down' arrow. The 'OK' allows us to accept and advance to the next menu item as we walk through the settings. The 'Up' arrow button allows us to increase a numeric value or choose the next parameter, while the 'Down' arrow button allows us to decrease a numeric value or choose the previous parameter. If no key is activated for 1 minute, the display will return to the default state (1.0) without saving the changed values or parameters.

NOTE: After programming, the module can be left on the Signal Conditioner to display readings, or it can be removed and used to program other units, or copy saved programs to other units.

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Display Abbreviations

Abbreviations used on the 884501 display

- FL.ER = flash memory error
- AO.ER = no load for current output (4-20 mA only)
- NO.CO = connection error
- IN.ER = error levels on input
- TY.ER = configuration in 884501 doesn't match this product
- ADV.SET = advanced settings
- IN TYPE = input type
- V.RANGE = voltage range
- I.RANGE = current range
- CONNEC. = connecting wires
- Pt TYPE = Platinum RTD type
- Ni TYPE = Nickel RTD type
- TC.TYPE = thermocouple type
- DEC.P = decimal place location
- SE.BR = a sensor wire is not connected
- DECR = decreasing
- ACT.DIR = action direction
- DISP.LO = low display range
- DISP.HI = high display range
- REL.UN = relays set in units or % range
- Rx.FUNC = relay 1 / 2 function
- Rx.CONT = relay 1 / 2 contact type
- Rx.SETP = relay 1 / 2 setpoint
- Rx.HYST = relay 1 / 2 hysteresis
- ERR.ACT = relay action on error
- ON.DEL = relay on delay
- OFF.DEL = relay off delay
- ANA.OUT = analog output
- O.RANGE = output range
- OUT.ERR = output action on error
- OUT.LO = temp for low output
- OUT.HI = temp for high output
- EN.PASS = enable password
- NEW.PAS = new password
- CAL.LO = calibrate input low to process value?
- CAL.HI = calibrate input high to process value?
- USE.CAL = Use process calibration value?

NOTE: If no sensor or signal is connected to the input terminals, then the message SE.BR, as shown below, will flash in the display when the unit is first powered up. Press OK once to acknowledge the error and then immediately press OK again to go to Advanced Setup shown on the next page.

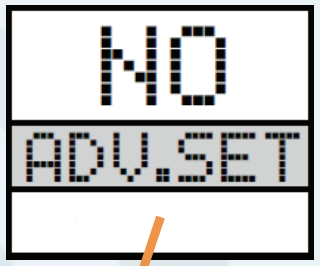
Sensor wire breakage

(Scrolling Help Text)

Start Programming

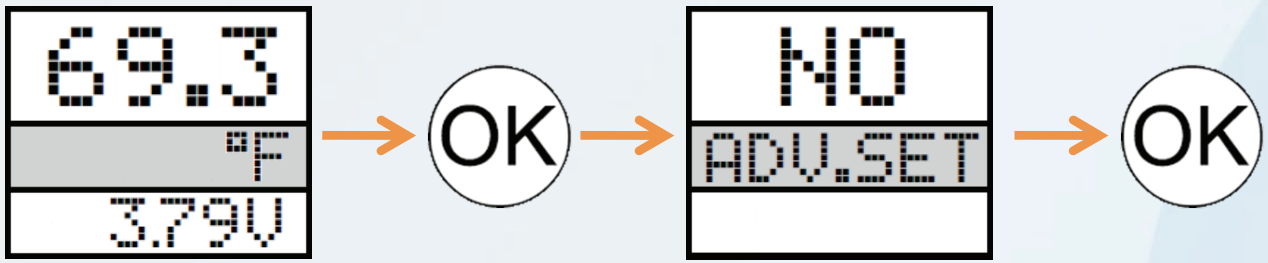
The Advanced Setup menu will be displayed. Make sure the top line indicates 'NO' and then press the 'OK' button to start configuring the signal conditioner. The Advanced Setup menu is explained later in regards to saving the configuration.

Also, if the unit is powered up with a good configuration, and an active signal is applied to the input terminals, the current value of the input signal will be displayed, along with the programmed engineering units and the value of the current analog output as shown below. Press the 'OK' button to go to the Advanced Setup, make sure 'NO' is displayed and press 'OK' again to start configuring the signal conditioner.



Enter advanced setup menu?

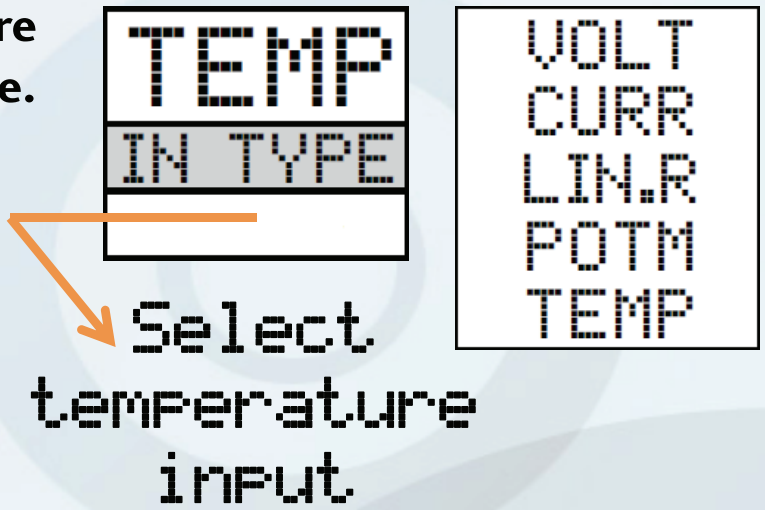
OK



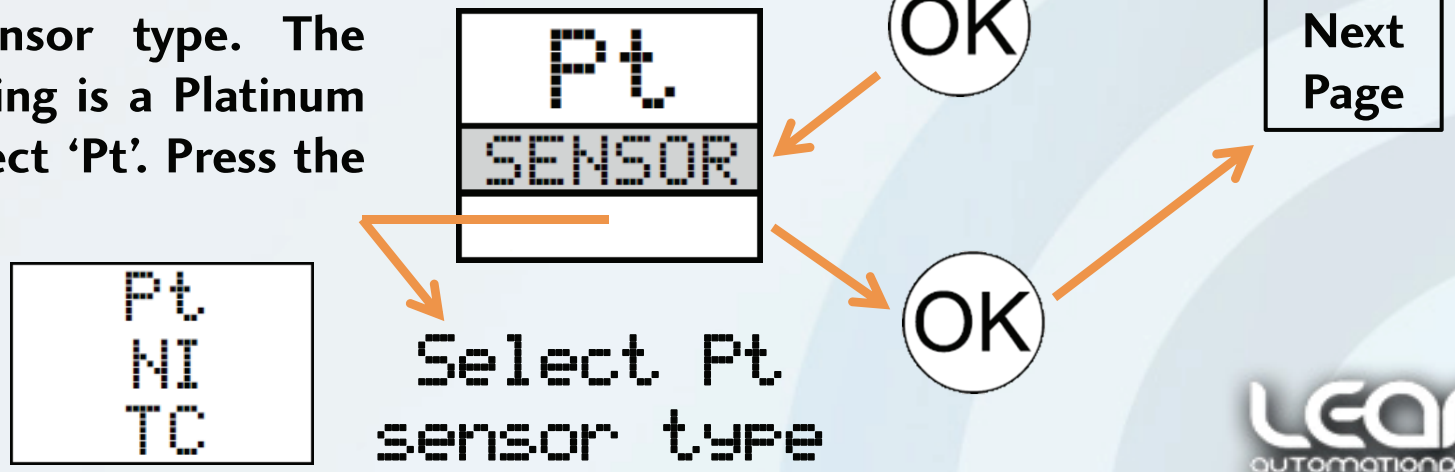
Next Page

Sensor Parameters – Input Type & Sensor Type

Select the input type. In our example, because we are using a RTD, we need to select 'TEMP' for temperature. Press the 'OK' button.



Select the sensor type. The RTD we are using is a Platinum style so we select 'Pt'. Press the 'OK' button.



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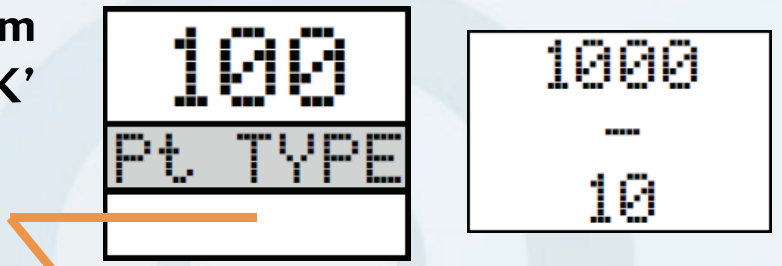
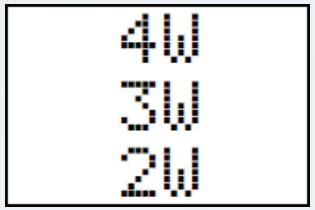
Sensor Parameters – Pt Type and Connection

Select the Pt type. We are using a 100 Ohm platinum RTD (Resistance Temperature Detector). Press the 'OK' button.



Select
Pt100 as
sensor type

OK



Select the connection type. The RTD we are using is a 3 wire type. Press the 'OK' button.

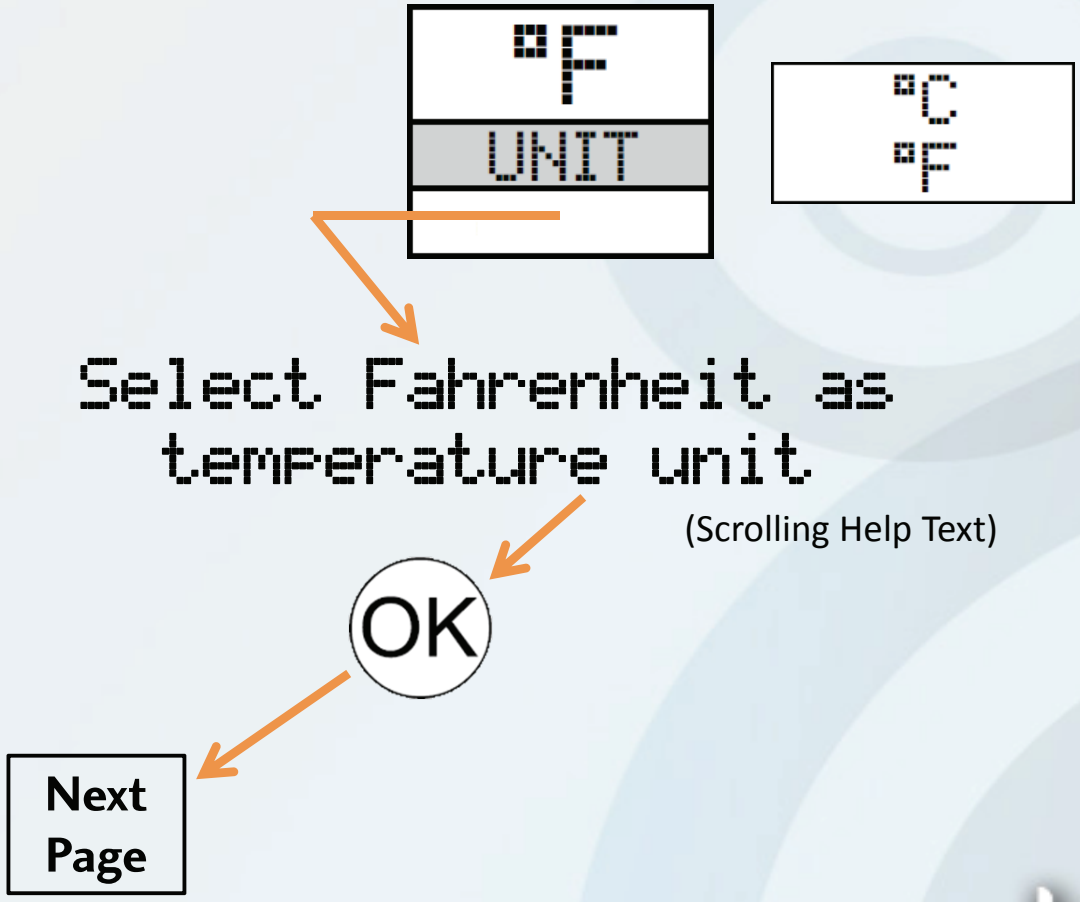
OK

Next Page

Select 3-wire
sensor connection

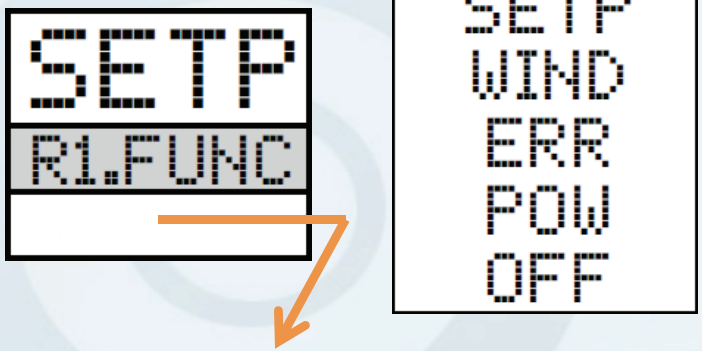
Sensor Parameters – Temperature Unit

Select the temperature unit. We choose Fahrenheit.
Press the 'OK' button.



Relay 1 Contact Function – Use Set Point

In our example we are using the 884116 signal conditioner that has two relay contact outputs available. The relay contacts can be set to operate at pre-programmed set points, or other conditions. We are using relay contact 1 to activate at a set point. Select 'SETP' and press the 'OK' button.



Select SETPOINT function – relay is controlled by 1 setpoint.

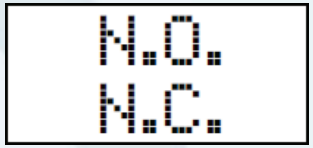
(Scrolling Help Text)

OK

Next Page

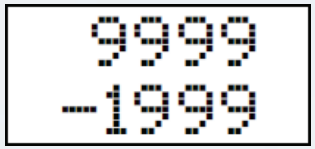
Relay 1 Contact Function & Set Point

Select the contact type as 'N.O.' (Normally Open). Press the 'OK' button.



Select Normally Open contact

(Set point range)



OK

Set the relay contact operating set point for 70.0 degrees, which in our example will be in Fahrenheit. Press the 'OK' button.

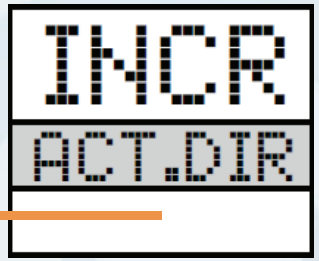
OK

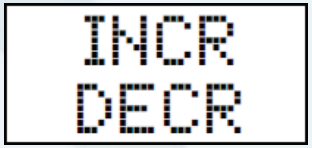
Next Page

Set relay setpoint

Relay 1 Contact Function – Activation & Hysteresis

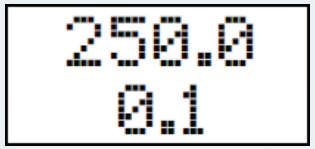
Select 'INCR' so that the relay contact is activated by an increase in the input signal. Press the 'OK' button.





* **Hysteresis** 'refers to systems which have *memory*; that is, the effects of the current input to the system are not felt at the same instant.'

(Hysteresis range)



Activate relay on increasing signal

OK

Next Page

Set relay 1's hysteresis for a default value of '1.0'. Press the 'OK' button.

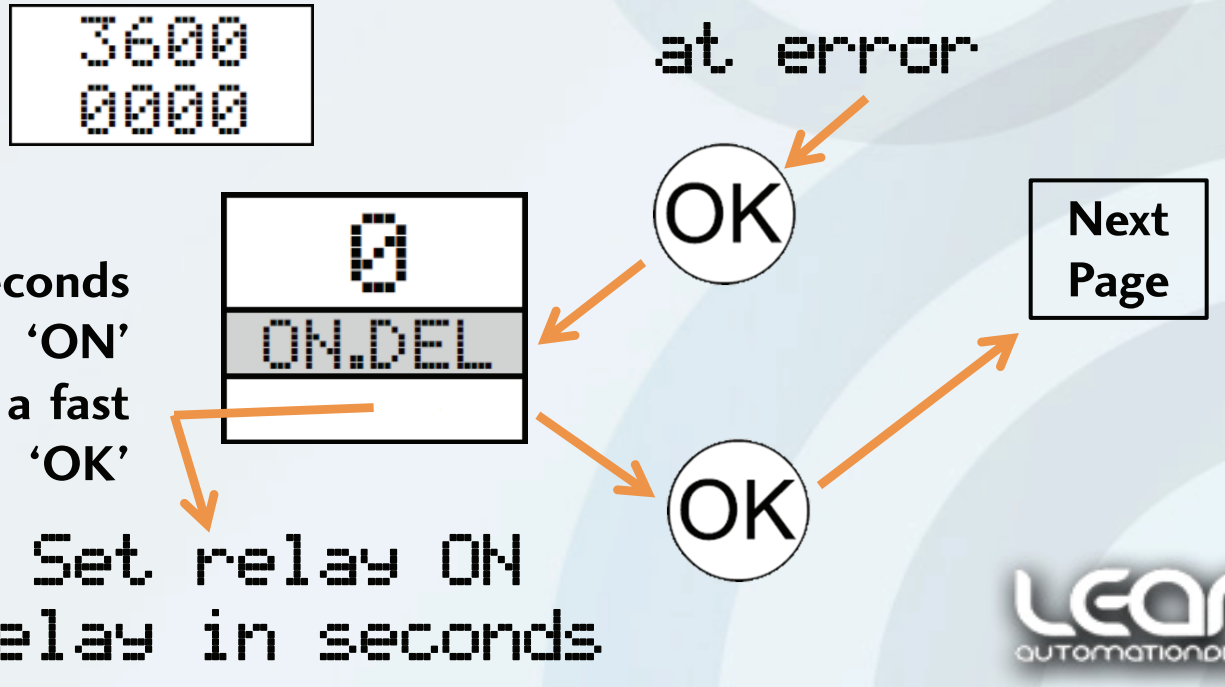
OK

Set relay hysteresis

Relay 1 Contact Function – On Error & ON Delay

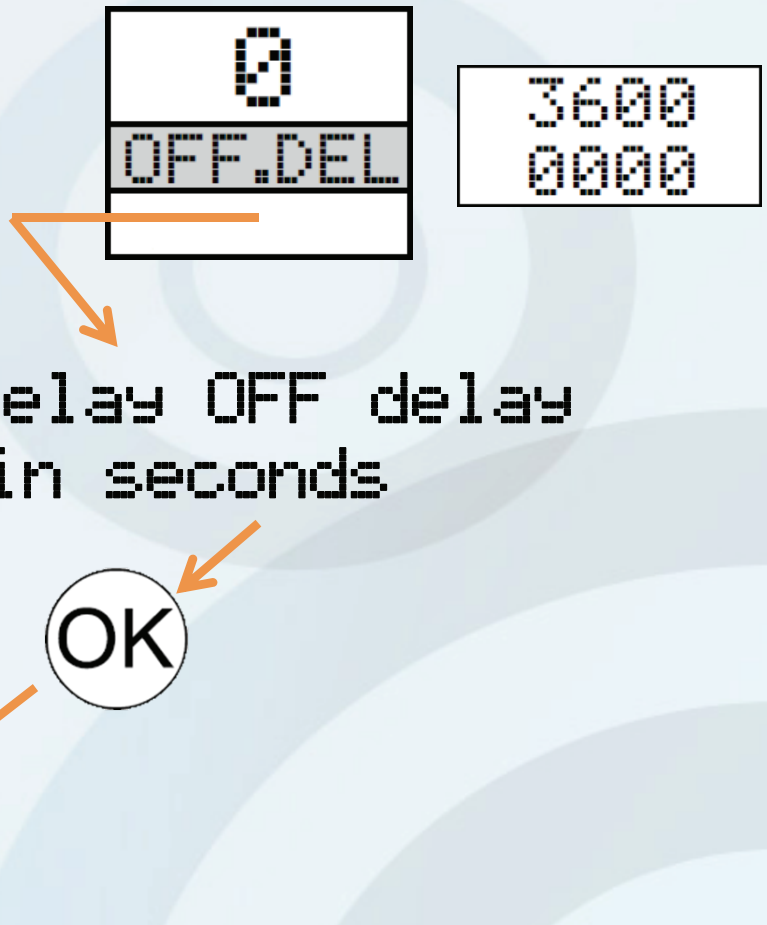
For the error action, select 'HOLD' so the relay stays in its last state if an error occurs. Press the 'OK' button.

Leave a default of '0' seconds for the relay contact's 'ON' delay. We are looking for a fast response. Press the 'OK' button.



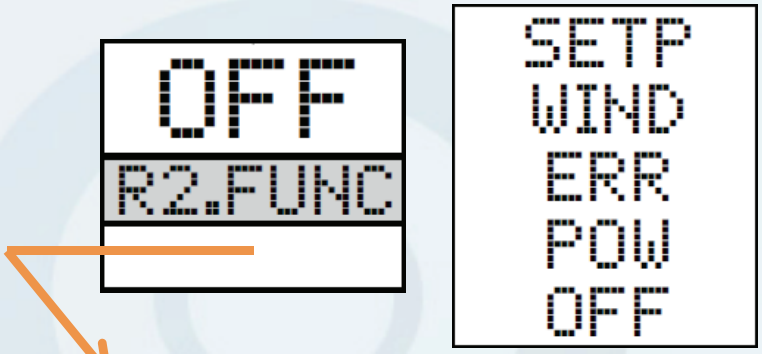
Relay 1 Contact Function – OFF Delay

Leave a default of '0' seconds for the relay contact's 'OFF' delay. We are looking for a fast response. Press the 'OK' button.



Relay 2 Contact Function – Not Used

In our example we are not using relay 2's contact output so it can be configured as 'OFF'. Press the 'OK' button.



Select OFF function – relay is permanently off

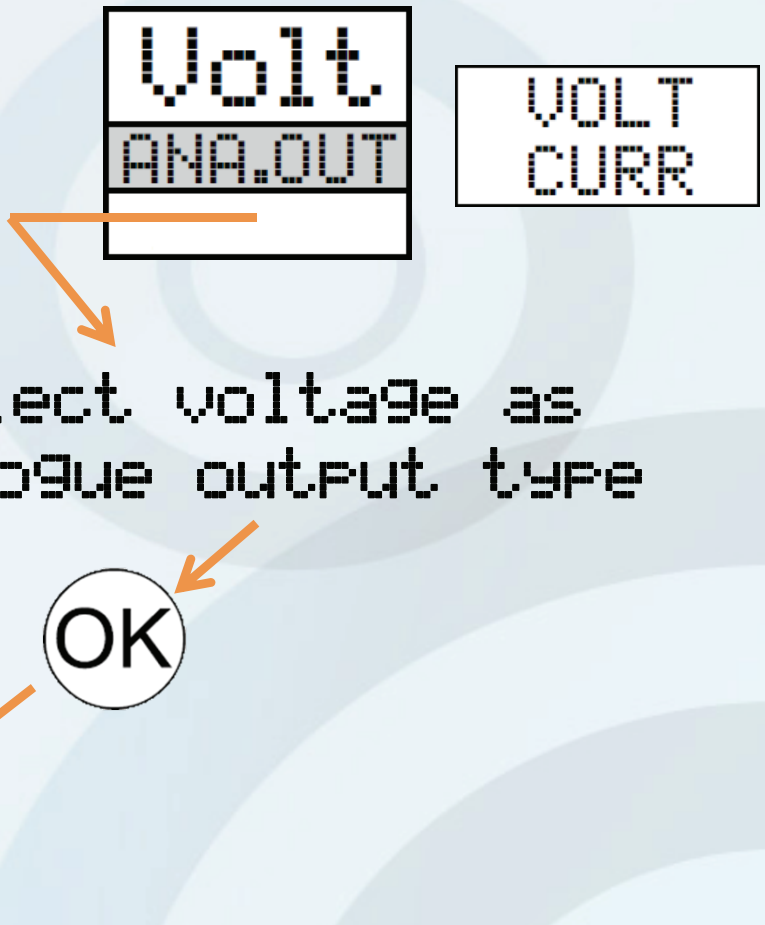
(Scrolling Help Text)

OK

Next Page

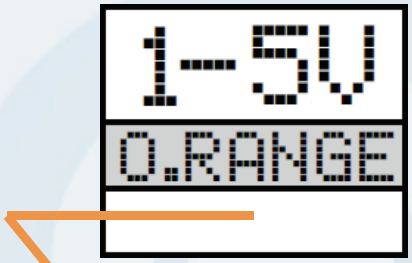
Analog Output Configuration – Output Type

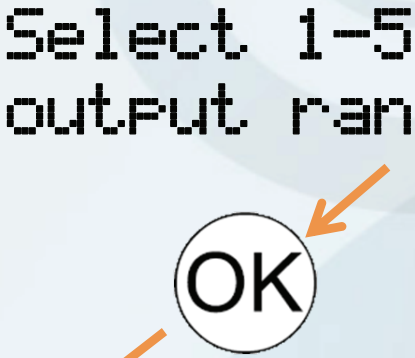
In our example we want to output a voltage to the CLICK PLC's analog input, so we need to select a voltage analog output. Press the 'OK' button.



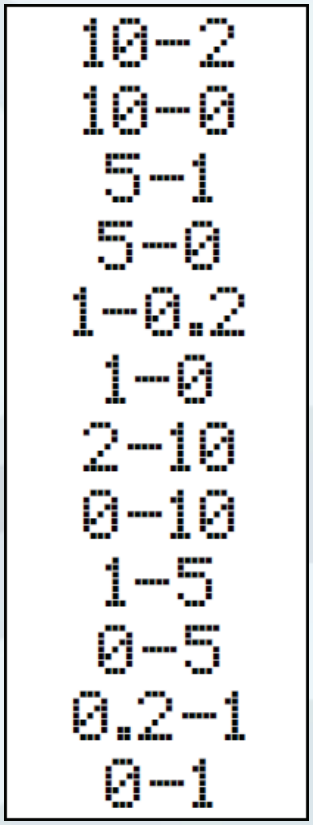
Analog Output Configuration – Output Range

We have setup the CLICK PLC's analog input to accept a 1-5 VDC analog signal, so we need to select a analog voltage output form the signal conditioner to also be 1-5 VDC. Press the 'OK' button.





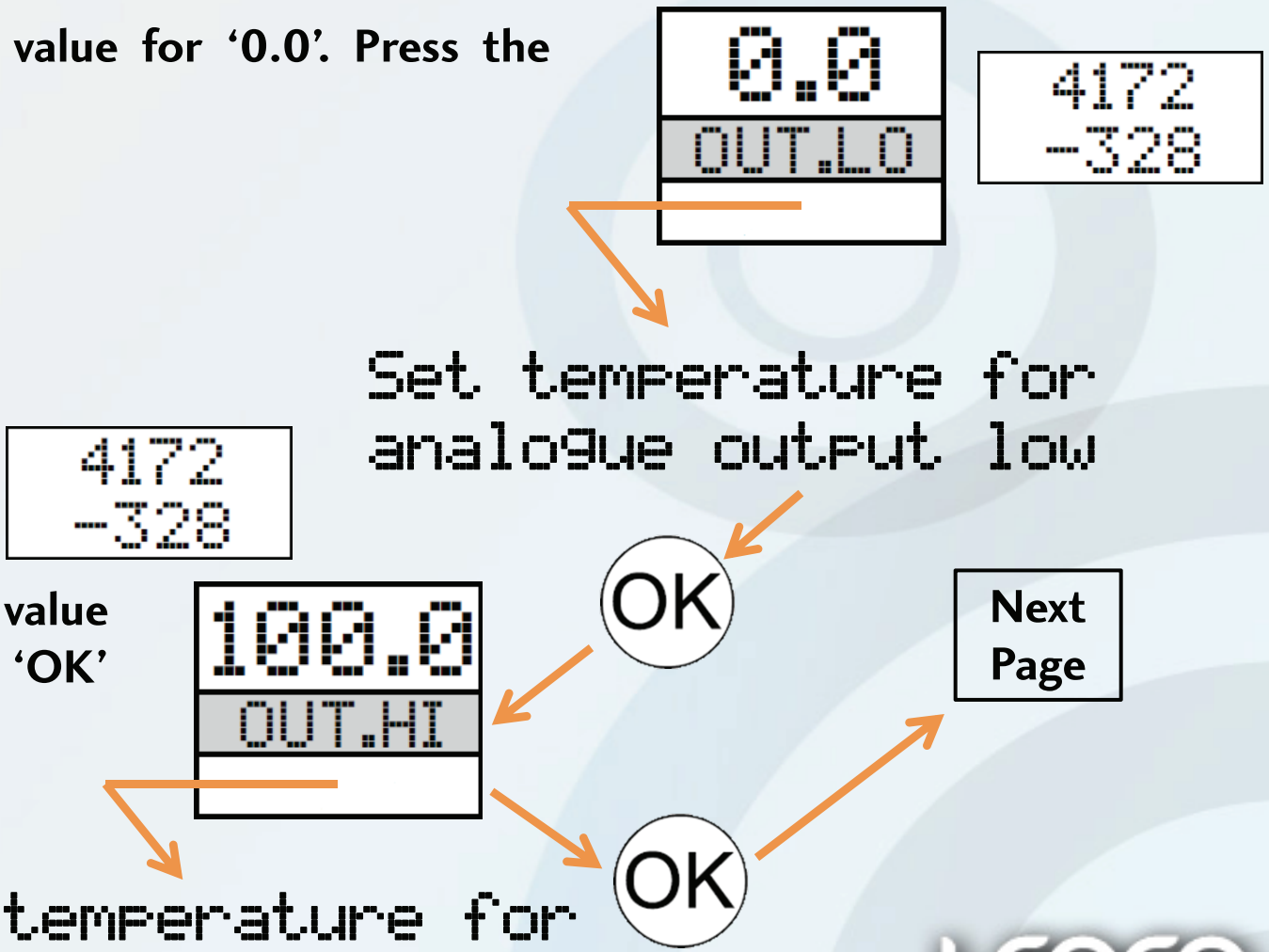
Next Page



(Available choices)

Analog Output Configuration – Temperature Range

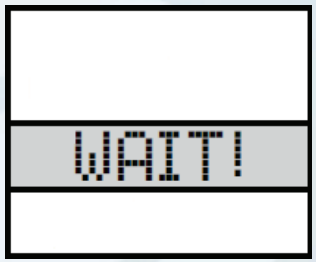
Set the temperature low value for '0.0'. Press the 'OK' button.

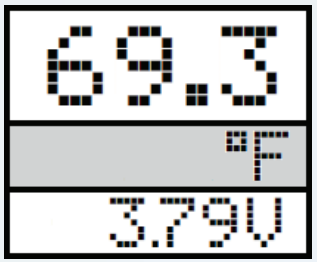


Set the temperature high value for '100.0'. Press the 'OK' button.

Configuration Completed – WAIT!

After the last entry into the signal conditioner, the display will show 'WAIT!' for a couple of seconds while the unit's memory is being updated. Once the update is complete, the display will return to the normal operation of showing the input signal, units, and analog output. Configuration is now complete.





Advanced Setup – Saving & Loading Configuration

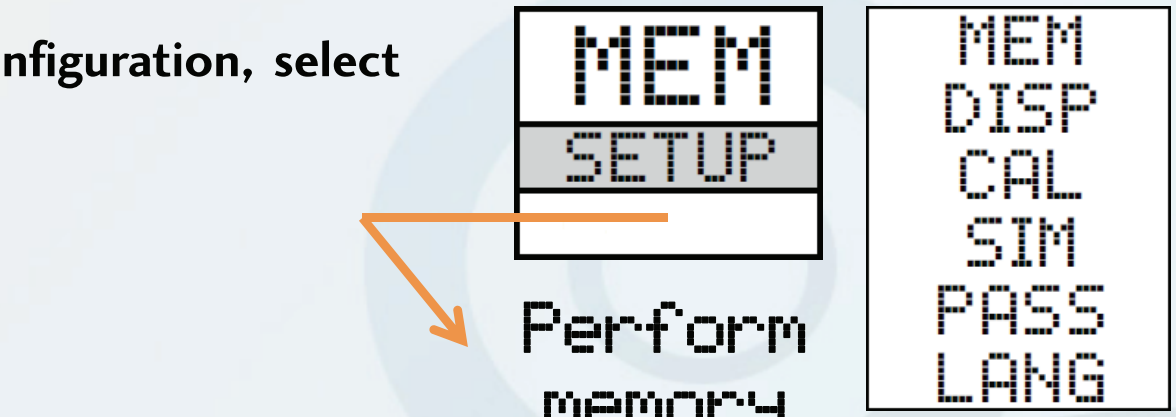
Press ‘OK’ to bring up the Advanced Setup menu. Make sure the top line indicates ‘YES’ and then press the ‘OK’ button to go to the Setup options for the signal conditioner.

NOTE: The saved configuration in the display unit can only be loaded to the same type of signal conditioner module. So 884114 to 884114 or 884116 to 884116.

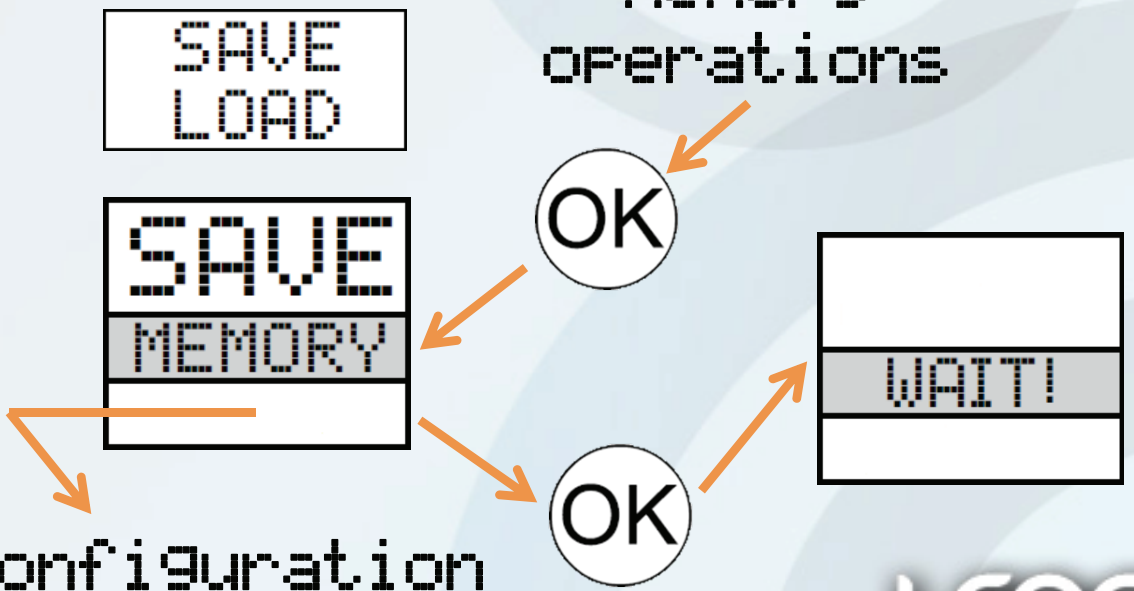
Next Page for Saving,
Page after for Loading

Advanced Setup – Saving the Configuration

To save the signal conditioners configuration, select 'MEM' and press the 'OK' button.



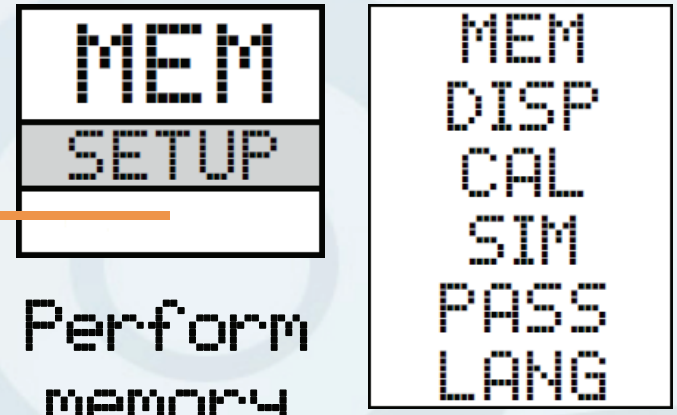
Select 'SAVE' and press the 'OK' button. The display will show 'WAIT!' for a few seconds and then return to the main display. The configuration is now saved in the 884501.



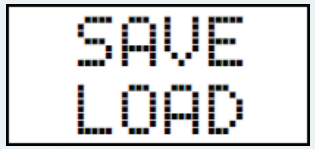
(Scrolling Help Text)

Advanced Setup – Loading the Configuration

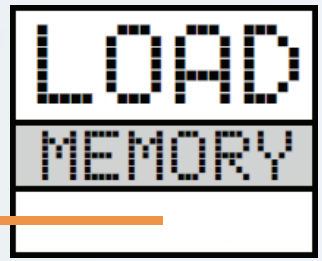
To load the configuration that is stored in the 884501 programming/display unit into the signal conditioner, select 'MEM' and press the 'OK' button.

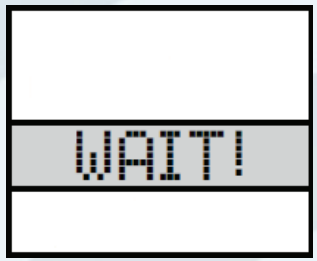


Perform memory operations



OK





OK

Select 'LOAD' and press the 'OK' button. The display will show 'WAIT!' for a few seconds and then return to the main display. The configuration is now saved into the signal conditioner.

Load saved config-uration into module

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Go to the following link for additional information:

http://www.automationdirect.com/static/manuals/univsigcondm/univsigcondm.html

884501

884114

884116

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Other available videos in this series.

Title	VID Number
Part 1 – Overview & Applications	L-PROC-SC-001

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