

Sigma Controls, Inc.

PROCESS CONTROLS AND INSTRUMENTATION



CM18 CELLULAR MONITOR

Version 4.3

MODEL CM18-DLR

THE CM18 SMS MESSENGER PROVIDES CONTINUOUS
MONITORING FROM VARIOUS INPUTS

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PRODUCT OVERVIEW

Texting has become an integral part of our lives. The ease and convenience combined with the time stamping and logging of messages, makes it a great way to communicate with friends, family and business associates. So why not enjoy the same benefits in your alarm dialer? That's what the CM18 does for you.

When an alarm is triggered, the unit will text message up to 8 recipients the alarm message in English, as you have custom programmed it.

EXAMPLE

"PUMP STATION 3" ALARMS PAGE 1

POWER ON BattV = 100% HIGH

LEVEL ALARM END OF ALARMS

The CM18 uses 4 character codes to communicate.

Contact it any time for status update. Text to it "DATA" And it will send you a report on alarms and other status flags. It will contact you every day with a report if you wish.

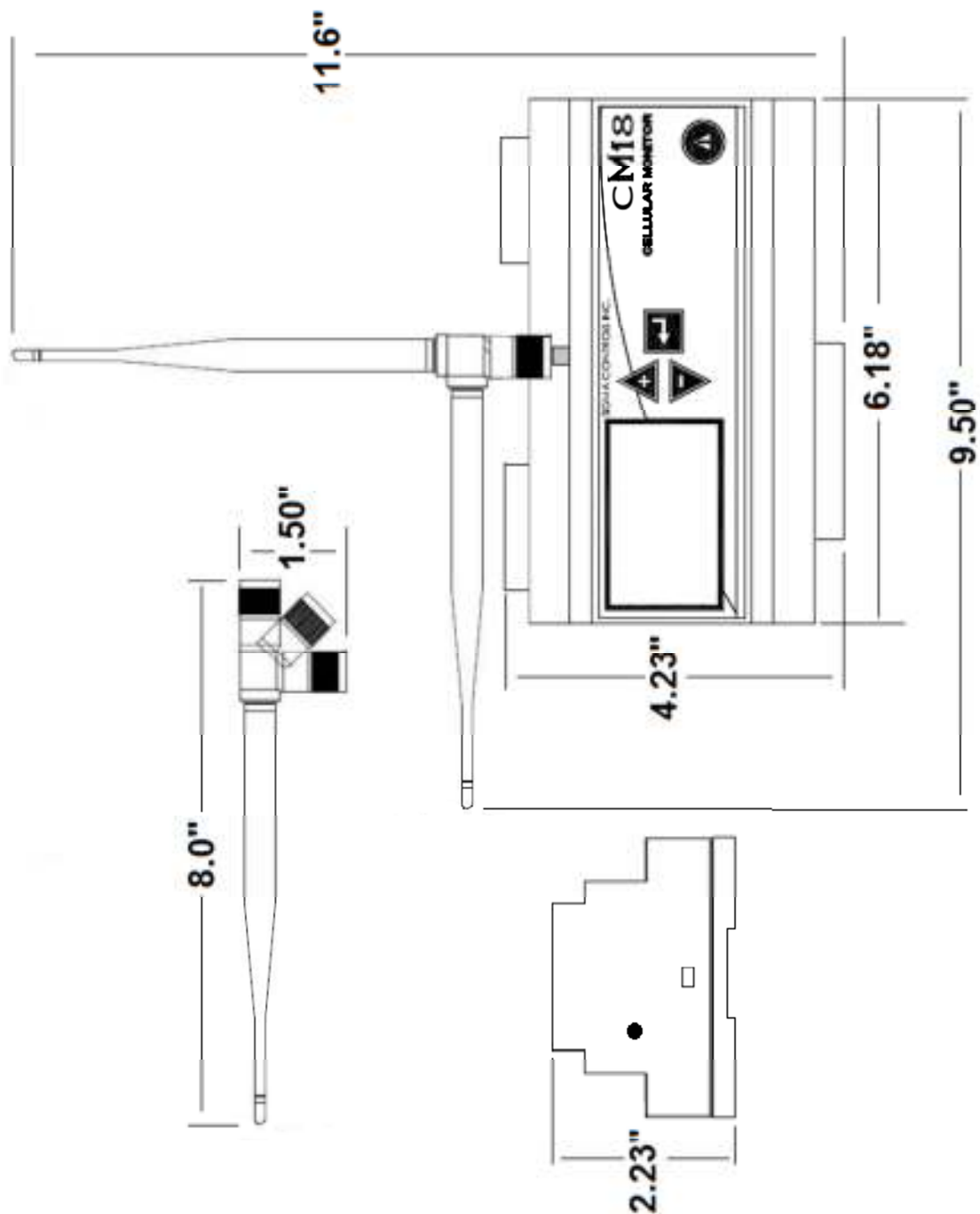
Text to it "STOP" while an alarm is active to clear it. Alternatively, while the CM18 is in alarm and you receive a text message, you can respond with a text saying "HALT" that will stop the CM18 from texting anyone else.

The CM18 has expansion capabilities and can be customized for specific applications and OEM needs. Private labeling is available. Optional expansion PCBs and capabilities will be rolled out over time. Check in with us for updates or sign up for our newsletter from our website's front page at **sigmacontrols.com**.

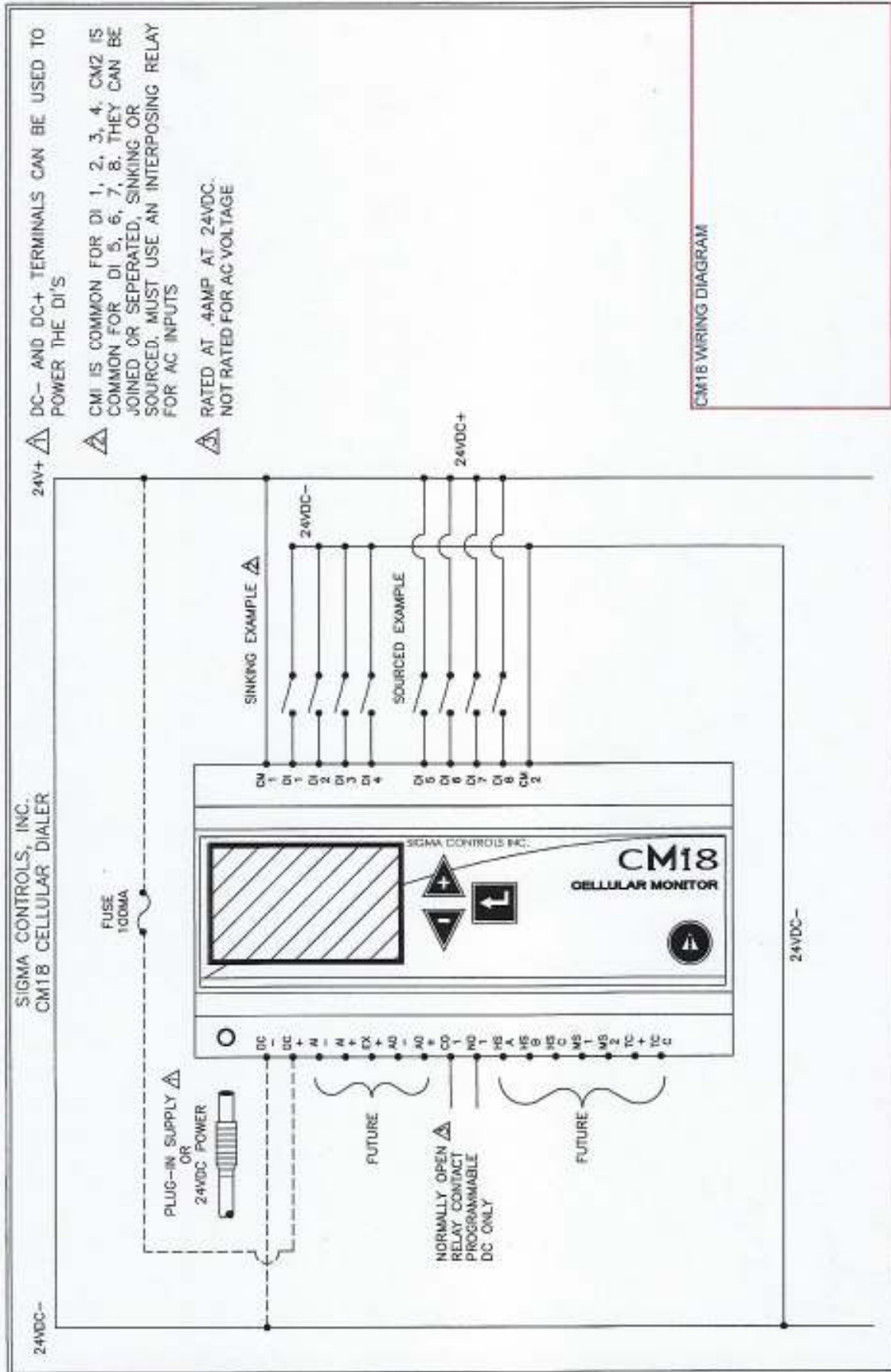
SPECIFICATIONS

Inputs (8 ea.)	Digital, Dry Contact or +DC or -DC
Outputs (1 ea.)	Switching Voltage Max DC/Peak AC Resist. Volts 200 Switching Current Max DC/Peak AC Resist. Amps 0.5 Carry Current Max DC/Peak AC Resist. Amps 1.0 Contact Rating Max DC/Peak AC Resist. Watts 10
Display	LCD, 20 Character X 4 line display
4 User Keys	Up, Down, Acknowledge, Enter
Lockout	User password
Power	24VDC 1 AMP
Environmental	Operating 5°-45° C (41°-113°F), Storage -20°-60°C (-4°-140°F)
Enclosure	1/4 DIN, ABS plastic 6.1 X 4.3 X 2.3 inches
Rating	Nema 1
Access	SIM Card & contrast adjust
Terminal Strips (2)	(10) + (16) 'Pluggable' for ease of wiring 20 – 16AWG
Programming	SMS Messages and menu based, parameters are user configurable via menu prompt and the user keys using the preconfigured screens and 'pull down' sub menus with English prompts assures rapid setup and commissioning.
Warranty	1 Year Warranty
Options	Various additional inputs and outputs (Future)
Data	SMS Texting and Modbus® RTU RS 485 Slave (custom hardware and software)
SIM card	Text only – NANO size – AT&T Network – LTE – 4G VERIZON – LTE - 4G

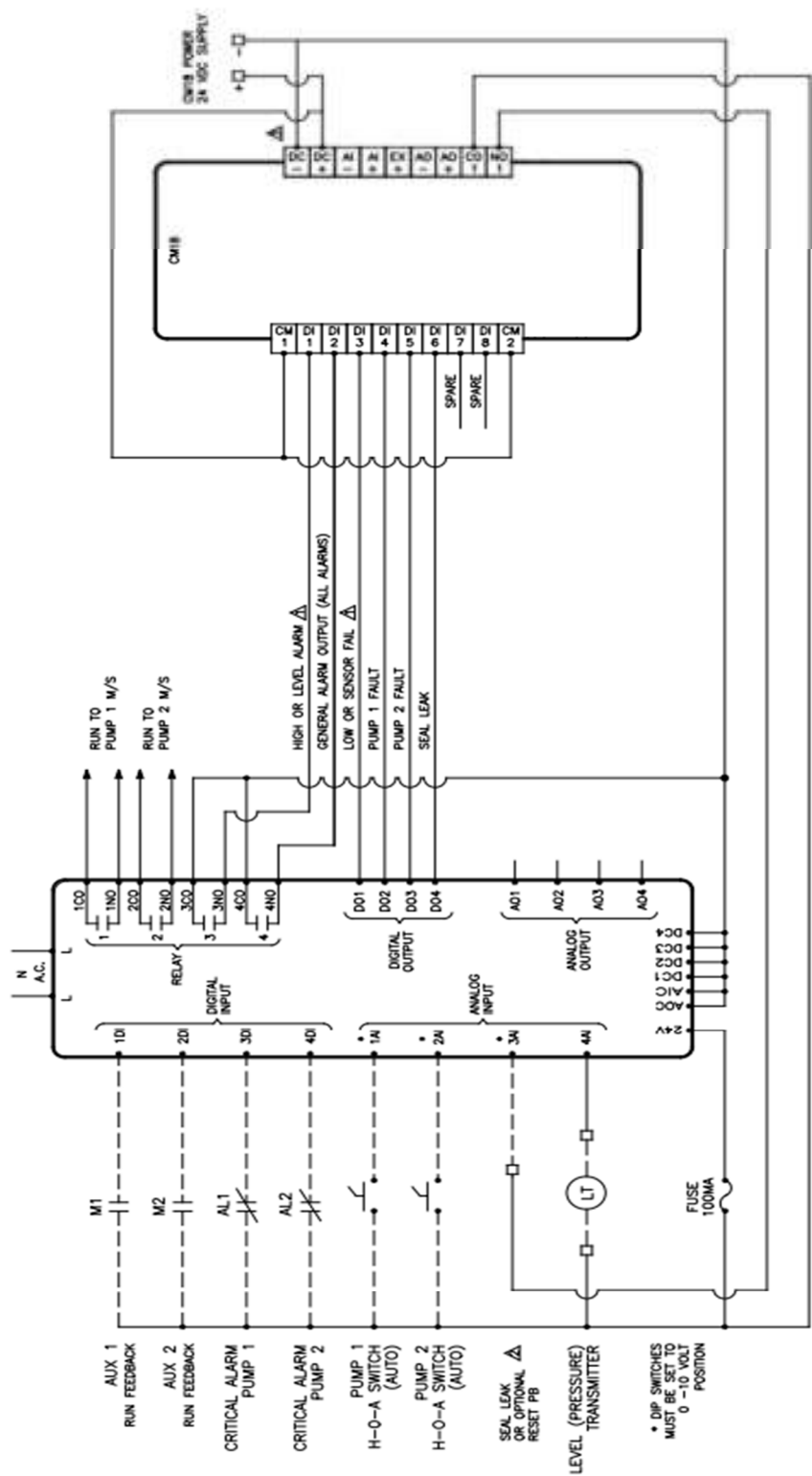
MECHANICAL



TYPICAL WIRING DRAWING



MYRIAD DPC TO CM18 DRAWING

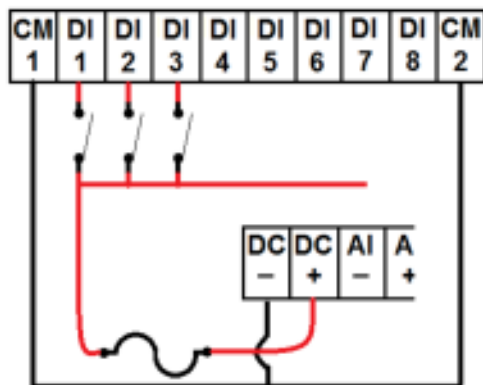


WIRING CONNECTIONS

Digital Inputs connections

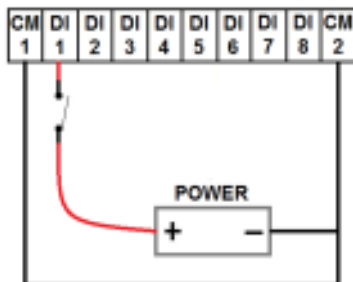
The inputs are grouped together in two sets. CM 1 is the common for 1-4. CM 2 is the common for 5-8. They must be used with DC voltage only, 5VDC -24VDC. The polarity can be either direction, as long as there is a difference of potential between the DI and the common, it will register as a closure. Most of the time the commons are connected together.

Connecting dry contacts to the digital inputs.



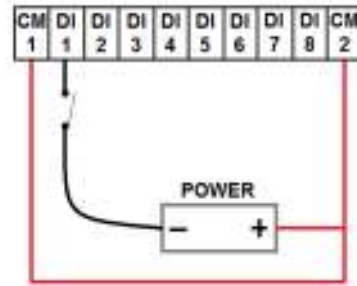
This example uses the 24VDC input terminals to drive the dry contacts from the field.

Connecting a sourced input.



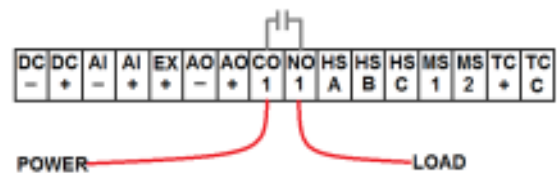
The common is negative. When positive is applied to the input, the indicator on the main screen will darken.

Connecting a sinked input.



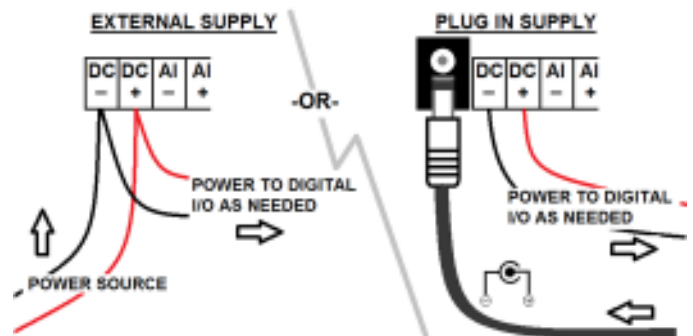
The common is positive. When negative is applied to the input, the indicator on the main screen will darken.

Connecting the relay output.



This relay is a very low wattage. It is intended to bring on an indicator, provide an input to a PLC or engage a small relay. See specification page 4.

POWER CONNECTIONS

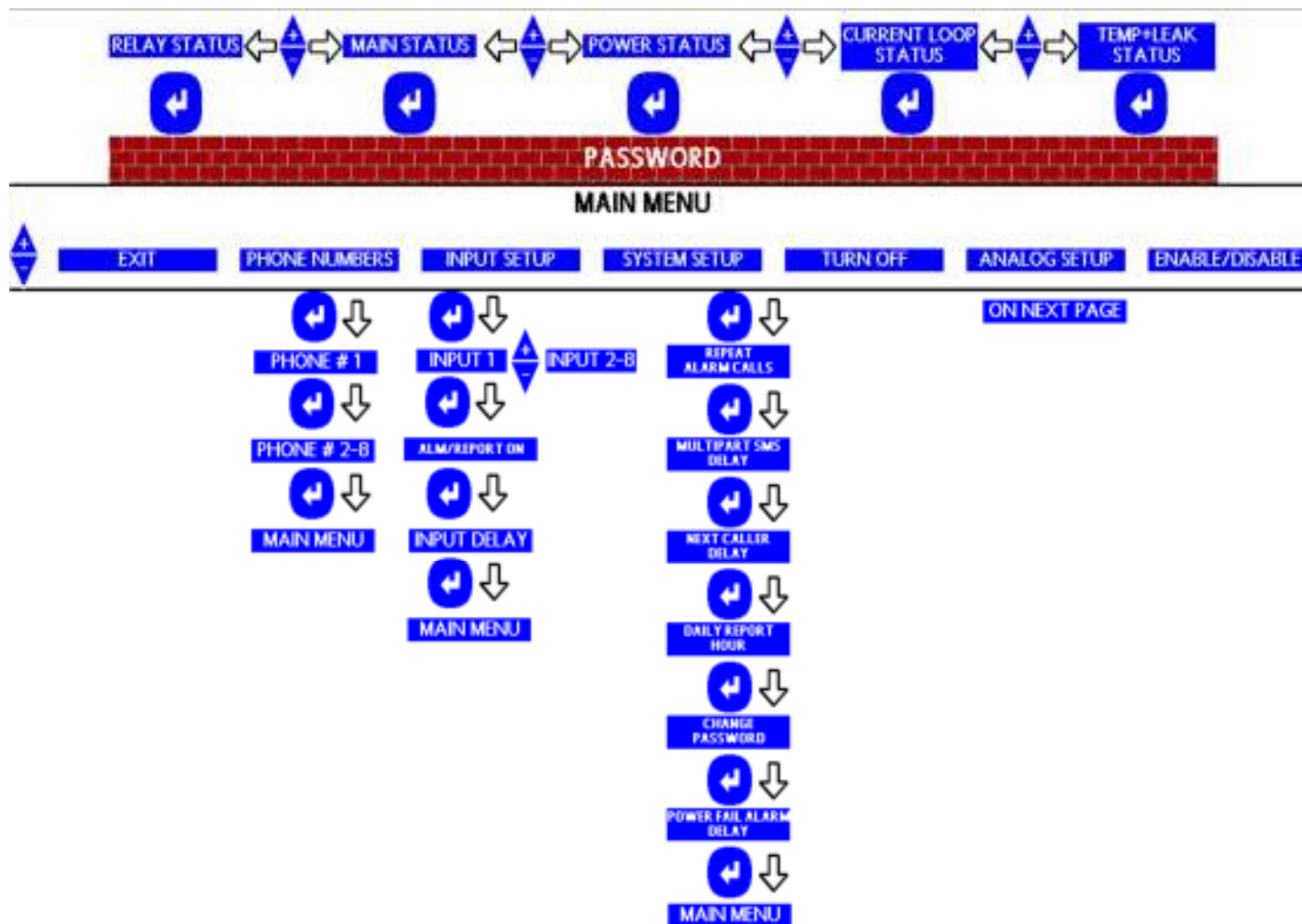


1 AMP at 24VDC is suggested for an external power supply. Our plug in supply is available when ordering.

CM18 SMS MESSENGER TEXT CODES V5.

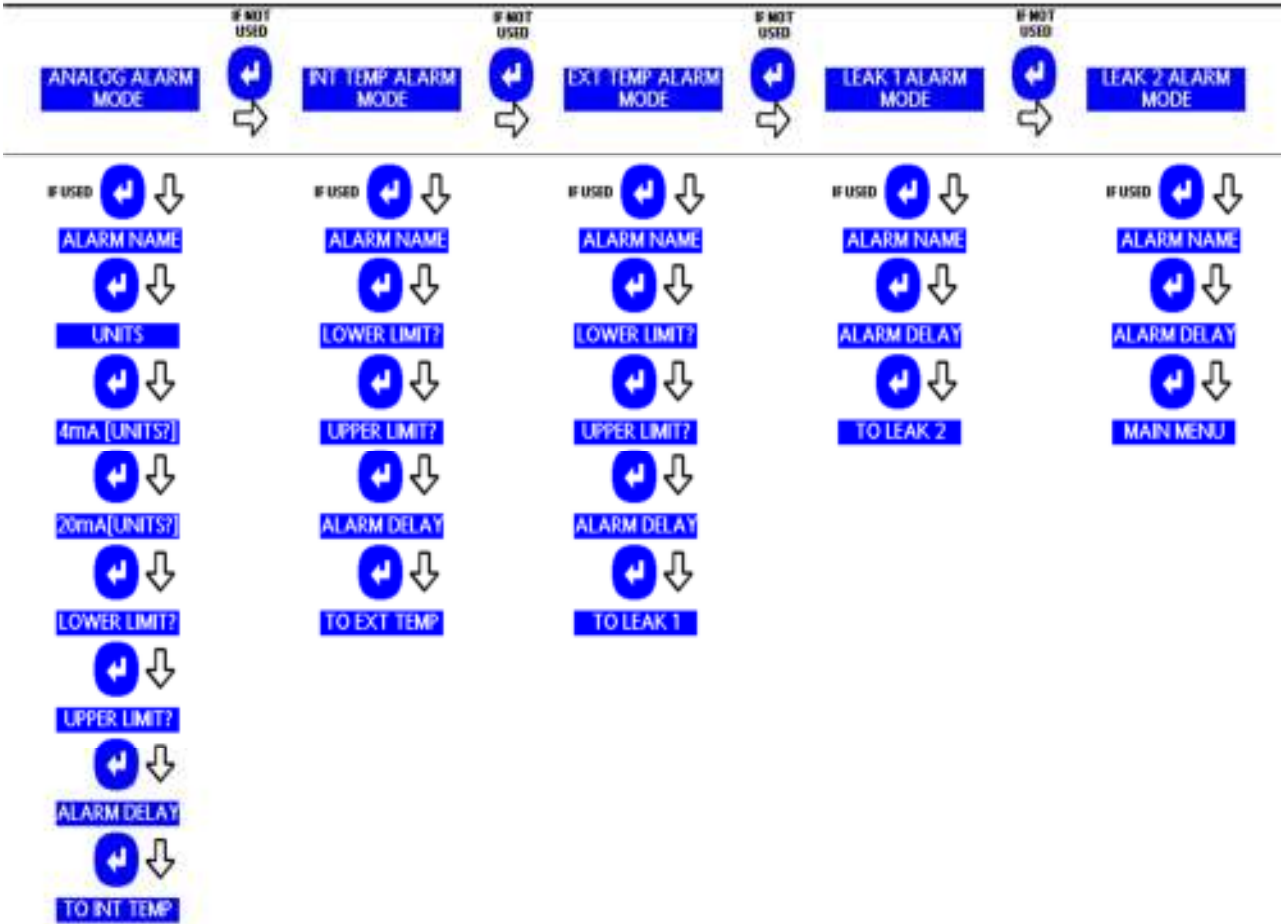
<u>CODE</u>		<u>FOLLOWED BY =</u>	<u>DEFAULT</u>
SITE	READ LOCATION NAME N/A	CHANGE LOCATION NAME	MY LOCATION
DI01	READ ALARM 1'S NAME	CHANGE ALARM 1'S NAME	ALARM 1
DI02	READ ALARM 2'S NAME	CHANGE ALARM 2'S NAME	ALARM 2
DI03	READ ALARM 3'S NAME	CHANGE ALARM 3'S NAME	ALARM 3
DI04	READ ALARM 4'S NAME	CHANGE ALARM 4'S NAME	ALARM 4
DI05	READ ALARM 5'S NAME	CHANGE ALARM 5'S NAME	ALARM 5
DI06	READ ALARM 6'S NAME	CHANGE ALARM 6'S NAME	ALARM 6
DI07	READ ALARM 7'S NAME	CHANGE ALARM 7'S NAME	ALARM 7
DI08	READ ALARM 8'S NAME	CHANGE ALARM 8'S NAME	ALARM 8
RLY1	READ THE RELAY'S NAME	CHANGE THE RELAY NAME	RESET PB
PH01	READ 1 st RECIPIENT P/N	CHANGE 1 st RECIPIENT P/N	
PH02	READ 2 nd RECIPIENT P/N	CHANGE 2 nd RECIPIENT P/N	
PH03	READ 3 rd RECIPIENT P/N	CHANGE 3 rd RECIPIENT P/N	
PH04	READ 4 th RECIPIENT P/N	CHANGE 4 th RECIPIENT P/N	
PH05	READ 5 th RECIPIENT P/N	CHANGE 5 th RECIPIENT P/N	
PH06	READ 6 th RECIPIENT P/N	CHANGE 6 th RECIPIENT P/N	
PH07	READ 7 th RECIPIENT P/N	CHANGE 7 th RECIPIENT P/N	
PH08	READ 8 th RECIPIENT P/N	CHANGE 8 th RECIPIENT P/N	
DATA	SENDS AN UPDATE	N/A	N/A
STOP	ACKNOWLEDGE ALARM	ACKNOWLEDGE ALARM	N/A
HALT	STOPS CM18 FROM TEXTING THE OTHER PHONE NUMBERS	N/A	N/A
TIME	SENDING TIME? SENDS YOU LAST TIME RESET	TIME=RESET RESETS ALL ETMS	N/A

PROGRAMING



PROGRAMING CONTINUED

ANALOG SETUP



SMS AND PUSHBUTTON PROGRAMMING

The various parameters are split between local push buttons and SMS messages. Some parameters are more secure if they are adjusted at the CM18 only. Some parameters would be very cumbersome to adjust with up and down keys only. See below for the local parameters.

USB PROGRAMMING

The USB port can be used instead of SMS messages to program the SMS adjustable parameters from a computer. A terminal program such as HyperTerminal is used. Contact us for details.

STATUS SCREENS AND NAVIGATION



Starting with the top line, we show the cell carrier being used by the CM18, followed by the units phone number. The third line includes the date & time, which is updated from the cell towers. The cell signal strength, measured in db, is also shown on this line.

KEYS

The up and down keys are used to increase or decrease a value. The up key might switch an off/on value to on while the down key will switch it to off. These keys are also used to scroll a menu list up and down.

The enter key executes the cursor selection. Usually navigating to another screen.

The function of the Δ key is programmable but it is commonly used to acknowledge an alarm locally. Holding the key might disarm the system.

Pressing the Up or Down keys from the main screen will display the next status screen.

Various status screens are used to show the state of the system without allowing changes. Pressing the enter key from the main menu brings you to the password screen. Then on to the main menu.

After making adjustments. Selecting exit and pushing enter will navigate you back out to the status screens. Whenever this is done, all of the settings are stored in memory. The Δ key can also be used to exit back to the status screens.

INPUT CONTACT STATUS



This screen shows the state of the digital inputs. An unfilled block ☐ indicates an open input, a filled block ☒ indicates a closed input.

RELAY/SIGNAL STATUS



This screen shows the state of the relay outputs. An unfilled block ☐ indicates a de-energized relay. A filled block ☒ indicates an energized relay.

Temp & Leak Status



The second line on the screen shows the internal temperature of the CM18, along with a temperature reading of an external temperature connection.
The 3rd line is the status of 2 available seal leak inputs.

Power Status



The second line shows incoming power of the CM18 along with the battery level in %. The third line shows the status of the battery.

PASSWORD



The default password is zero. Usually one would push enter at this point to go to the menu screen.

MAIN MENU



SHOW PHONE NUMBERS

Shows the recipients of the messages the CM18 will be texting out.

SETUP INPUTS

Model each digital inputs parameters for activation.

SYSTEM SETUP

Configuration of general systems settings.

TURN UNIT OFF

Disables battery & instructs you to unplug the CM18.

ANALOG SETUP MENU

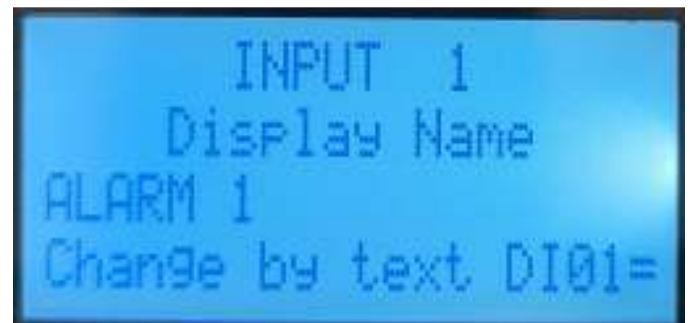
Configuration for 4-20mA, temperature & seal leak inputs.

ENABLE/DISABLE ALARMS

Typically recommended for setup of CM18.

INPUT SETUP

Display Name



Each input needs to be named. When activated, this language will be sent to you, differentiating the various inputs.
Entering alphabet characters with an up and down key would be tedious. So you must text

the name in using the syntax;
"DI01=XXXXXXXX".
Press enter to go to the next screen.

Send Alarm/Report on



Use the up and down arrow keys to select from the following options:
Input closed, input open, change of state, report only, and inhibit alarm.
Press enter to go to the next screen.

Input Closed Will send an alarm text message when the input goes from open to closed.

Input Open Will send an alarm test when the input goes from closed to open.

Input Changed Will send text message anytime the input changes state.

Report Only Inputs state will be included in the CM18's daily report. c for closed, o for open.

Example: oinput1, cinput2, input not used.

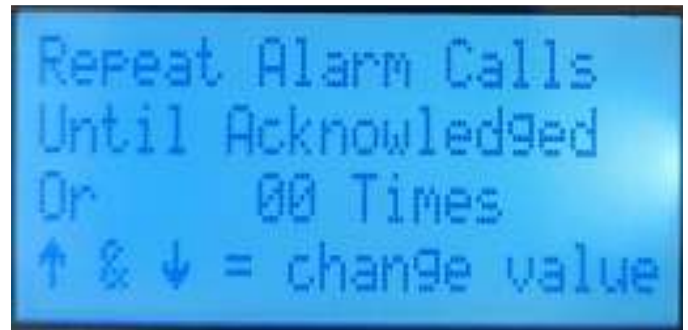
Input Delay



Use the up and down keys to set the delay time between the input activating and the channel alarming.
Press enter to go to the main menu.

SYSTEM SETUP

Repeat alarm calls



This screen sets the functionality of repeat alarm calls. Defaulted to 0, sets the amount of times the phone number list is texted for an alarm.

Press enter to go to the next screen.

MULTIPART SMS DELAY



Defaulted at 5 seconds. This sets the delay between texts in a two part text.

Press enter to go to the next screen.

Next Caller Delay



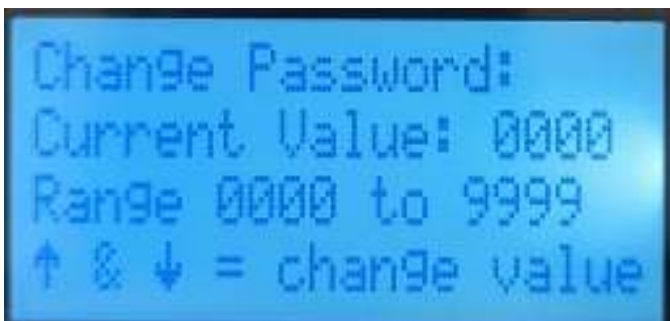
This screen set the delay that the CM18 texts its next recipient.

Daily Report Hour



This screen sets the hour (in military time) that the daily report will send.

Change Password



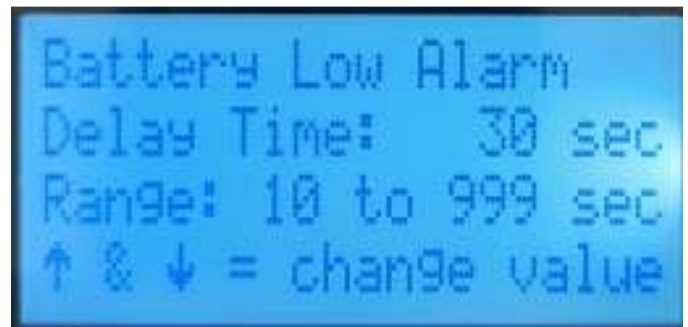
Defaulted at 0, the password can be changed at this screen. If changed, you must make note of this.

Power Fail Alarm



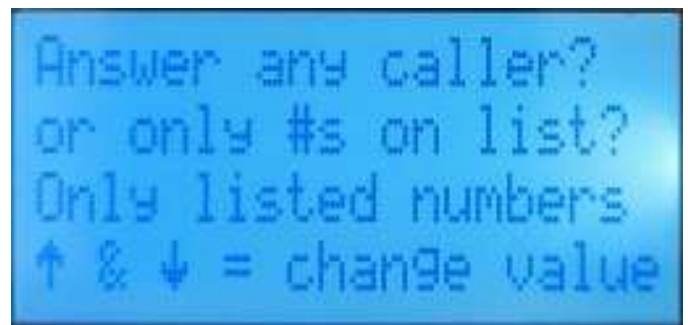
This screen sets the amount of time the CM18 will be without its main power source before going into an alarm.

Battery Low Alarm



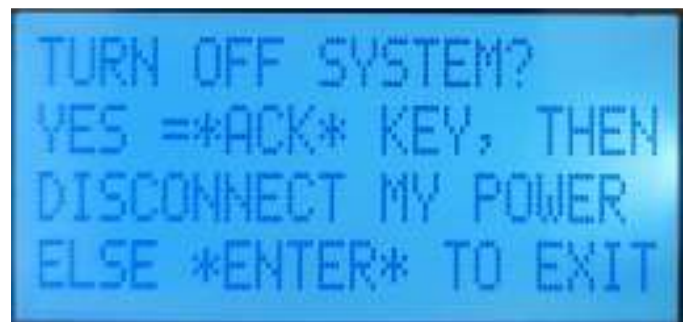
This screen sets the delay before the CM18 will text you when the battery is low.

Answer Any Caller?



This setting will lock out any phone number that isn't in the recipient list from communicating with the CM18. It is highly recommended that this setting be changed to allow anyone to text the CM18 when setting up yours for the first time.

Turn off System?



This screen will allow you to disable the CM18's battery and allow you to shut the CM18 down.

Seal Leaks

Alarm Mode



Choose from the following selections;
Input active
Input disabled
Report only

Alarm Name



This screen views the current name of the seal leak alarms. Change it by texting the CM18 LEK1= Followed by whatever you would like to name it.

Alarm Delay



This will set the time delay before a text is sent out for a seal leak alarm.

FCC info

Contains FCC ID: MCQ-XB3M1

Contains FCC ID: XPY2AGQN4NNN

The enclosed device complies with Part 15 of the

FCC Rules.

Operation is subject to the following two conditions:

(i.) this device may not cause harmful interference and

(ii.) this device must accept any interference received, including interference that may cause undesired operation.

FCC limits on antenna gain

Cellular antennas

The gain of the system antenna (i.e. the combined transmission line, connector, cable losses and radiating element gain) must not exceed the values below for mobile and fixed or mobile operating

configurations:

3.67 dBi in 700 MHz, i.e. LTE FDD-12 band

4.10 dBi in 850 MHz, i.e. LTE FDD-5 band

6.74 dBi in 1700 MHz, i.e. LTE FDD-4 band

7.12 dBi in 1900 MHz, i.e. LTE FDD-2 band

MODEL NUMBERING

	CM18-	DLR-	DR-	PL-	8-	1-	INT-	ATT-	NA
DLR = DIALER									
RTU = REMOTE TELEMETRY UNIT									
<u>MOUNTING</u>									
DR = DIN RAIL MOUNT									
N4 = NEMA 4 ENCLOSURE									
<u>POWER</u>									
PL = PLUG IN POWER SUPPLY									
PS = UNWIRED POWER SUPPLY									
<u>I/O</u>									
8 = NUMBER OF INPUTS									
1 = NUMBER OF OUTPUTS									
<u>ANTENNA</u>									
INT = ANTENNA ON CM18									
X3 = WITH 3 FOOT EXTENSION									
X6 = WITH 6 FOOT EXTENSION									
X12 = WITH 12 FOOT EXTENSION									
X25 = WITH 25 FOOT EXTENSION									
<u>SIM CARD</u>									
ATT= WITH AT&T SIM CARD									
VZN = WITH VERIZON SIM CARD									
TMO = WITH T-MOBILE SIM CARD									
<u>RS485 COMMUNICATION</u>									
NA= NO MODBUS COMMUNICATION									
MB= MODBUS									

Example. **CM18-DLR-DR-PL-8-1-INT-ATT-NA** is the standard dialer

MODBUS®

The CM18 does not have Modbus as a standard feature. It is possible to add it. Extra hardware, software, customization and cost would be involved.

QUICK SETUP GUIDE

GENERAL NOTE: Navigation of the CM18's display is by way of the UP, DOWN and ENTER buttons.

Step 1: Connect the CM18 to 24VDC power and wait about 2 minutes for it to power up - see the manual for the various sequence messages.

Step 2: When the CM18 is ready to be programmed, it will show a message containing the carrier name, the CM18's phone number, the date & time as well as the received signal dB level. Make note of the CM18's phone number, you will need it later.

Step 3: At this point, press the ENTER button and you should see a prompt to enter the local password (the default value is

00 (zero). Press the ENTER button again and you will see the main setup menu. Now press the UP or down button until you see the SYSTEM SETUP message on the third line of the display, and then press ENTER.

Step 4: Keep on pressing ENTER until you see the ANSWER ANY CALLER? message.

Step 5: Press UP or down if the third line shows "Only listed callers", and it should now show "Answer any call". (This is necessary to allow you to add phone numbers to the caller list.)

Step 6: Press the ENTER button again to return to the main menu.

Step 7: Now press the UP button until line 3 shows "ENAB/DISAB ALARMS"

Step 8: Press ENTER and the display shows ENABLE ALARMS? on line 1.

Step 9: If line 2 shows "ALARMS ENABLED", press UP to change the message to "ALARMS DISABLED", and then press ENTER to return to the main menu.
(This will allow you to program the alarm inputs without the CM18 sending extraneous alarms as you program the unit.)

Step 10: Now press UP until you see "SHOW PHONE NUMBERS", and press ENTER.

The display will show "PHONE #1 (8 unused)" on line 1, and "Call out number on line 2.

Now, on your cell phone, send the following text to the CM18: "PH01=", followed by your cell #

as an example PH01=2152573412 and send the message.

Two things will happen: The first line of the display will now show PHONE #1 (7 unused) and third line of the CM18 display will show the number you just sent, and you will receive a text message in the form ADDED PH01=2152573412.

If you send the CM18 the message "PH01?" it will send the message: PH01=2152573412 to you.

you can do this to all 8 stored phone number locations in the CM18 (PH01,PH02...PH08.)

A message in the form "PH02=" without a phone number will erase the phone number stored in that spot.

You can also overwrite the phone number previously stored in a location.

Using the UP or down button will show the next/prior phone number stored in the CM18.

Pressing ENTER will return you to the main setup menu.

Step 11: Decide on a (up to) 20 character name for the site, and name it by sending a message to the CM18 in the following format:

"SITE=CM18SITENAME"

The CM18 will reply with:

ADDED SITE=CM18SITENAME

You can query the CM18' site name by way of "SITE?"

Note that the CM18 changes all lower case letters to upper case, and doesn't care if the message is in upper or lower or mixed case.

Step 12: At this point, if you navigate to the system setup entry, and change the "answer any caller" choice to "Only Listed Numbers", the CM18 will ignore any calls from a number not on the list.

CAUTION: it is possible to delete your phone number from the list, and you will be blocked from accessing the CM18 until you physically go to the CM18 and change it to "answer any caller".

Note: At this point, you are ready to setup the alarm inputs.

SETTING UP THE ALARM INPUTS:

Let us assume that you wish to call the first alarm input, "HIGH WATER ALARM" and it is a switch that closes on detecting high water and that the second input is called "LOW WATER ALARM", and the input switch opens when the water is low.

A) Name the first input by sending the following message:

DI01=HIGH WATER ALARM

The CM18 then sends back: ADDED DI01=HIGH WATER ALARM

B) Name the second input by sending the following message:

DI02=LOW WATER ALARM

The CM18 then sends back: ADDED DI02=LOW WATER ALARM

C) Now define the input types by navigating to the SETUP INPUTS menu choice, and pressing ENTER.

D) You will see "INPUT 1" on the first line of the display, and "HIGH WATER ALARM" on the third line.

E) Press ENTER and you will see "Send Alarm Report on" on the second line of the display and a message on the third line of the display.

F) Press the UP or down button until you see "INPUT CLOSED" on the third line, and then press ENTER.

G) You will see "Input Delay" on the second line of the display. Set the delay time before the alarm is set by using the UP and DOWN buttons. (The range is from zero to 999 seconds)

H) Press ENTER to return to the SETUP INPUTS message, then press ENTER.

I) Press the UP button and the display will show "INPUT 2" on the first line and "LOW WATER ALARM" on the third line.

J) Press ENTER and you will see "Send Alarm Report on" on the second line of the display and a message on the third line of the display.

K) Press the UP or DOWN button until you see "INPUT OPEN" on the third line, and then press ENTER.

L) You will see "Input Delay" on the second line of the display. Set the delay time before the alarm is set by using the UP and DOWN buttons. (The range is from zero to 999 seconds)

M) Press ENTER to return to the SETUP INPUTS message.

N) Repeat the above if there are more inputs to setup.

O) Navigate to the "ENAB/DISAB ALARMS" menu and enable the alarms.

P) When you are finished, navigate to the "EXIT" choice on the MAIN SETUP MENU, and press ENTER, the display will go back to showing the CM18's phone number and the date & time as well as the received signal dB level of the cellular connection.

Q) Pressing the UP button will show you the INPUT CONTACT STATUS display. Closed inputs show as black rectangles instead of open rectangles.

R) Pressing the UP button again will show the state of the output relay drivers, with active drives show as black rectangles.

S) Pressing the UP again will show the internal and external (if connected) temperatures, and the status of the leak detector inputs.

T) Pressing the UP button again will show the status of the 4-20mA input (if connected and calibrated).

U) Pressing the UP again will return to the phone number and date/time display



WARRANTY

All Sigma Controls, Inc. products are warranted to be free from defective materials and workmanship for one (1) year from date of shipment. Sigma reserves the right to repair or replace at its option any product found to be defective. In no event shall Sigma Controls, Inc. be liable for any consequential, incidental, or special damages and the limit of its liability shall not exceed the purchase price of the supplied equipment.

*******IMPORTANT*******

SENSORS AND CABLE THAT HAVE BEEN USED IN WASTE WATER OR HAZARDOUS LIQUIDS MUST BE THOROUGHLY CLEANED BEFORE RETURNING. UNITS RETURNED UNCLEANED WILL BE CONSIDERED UNREPAIRABLE AND RETURNED TO SENDER OR DISCARDED. NOTE: DO NOT SUBMERGE UNITS FOR CLEANING WITH CABLE CUT OR REMOVED. THIS WILL ALLOW CLEANING FLUID TO ENTER HOUSING, DAMAGING ELECTRONICS AND VOIDING THE WARRANTY.

RETURN FOR REPAIR POLICY (WARRANTY/NON-WARRANTY REPAIR)

Return status can be determined upon factory inspection of returned equipment.

A completed Return Authorization form must accompany all items returned for repair.

Repairs will be evaluated as quickly as possible. Cost for non-warranty repairs will be provided before repairs are initiated and repairs will be completed only after approval by customer.

217 S. Fifth Street, Perkasio, PA 18944 PH: 215-257-3412 FAX: 215-257-3416