Sigma Controls, Inc.
PROCESS CONTROLS AND INSTRUMENTATION


# CM18 CELLULAR MONITOR

Version 1.21

MODEL CM18-DLR

**THE CM18 SMS MESSENGER PROVIDES CONTINUOUS MONITORING FROM VARIOUS INPUTS**

**VISIT OUR WEBSITE AT SIGMACONTROLS.COM**

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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"

"HIGH LEVEL ALARM"

The CM18 uses 4 character codes to communicate but you only need to know one. "HELP?" The response will contain a few tips and a link to our YouTube page with complete tutorials.

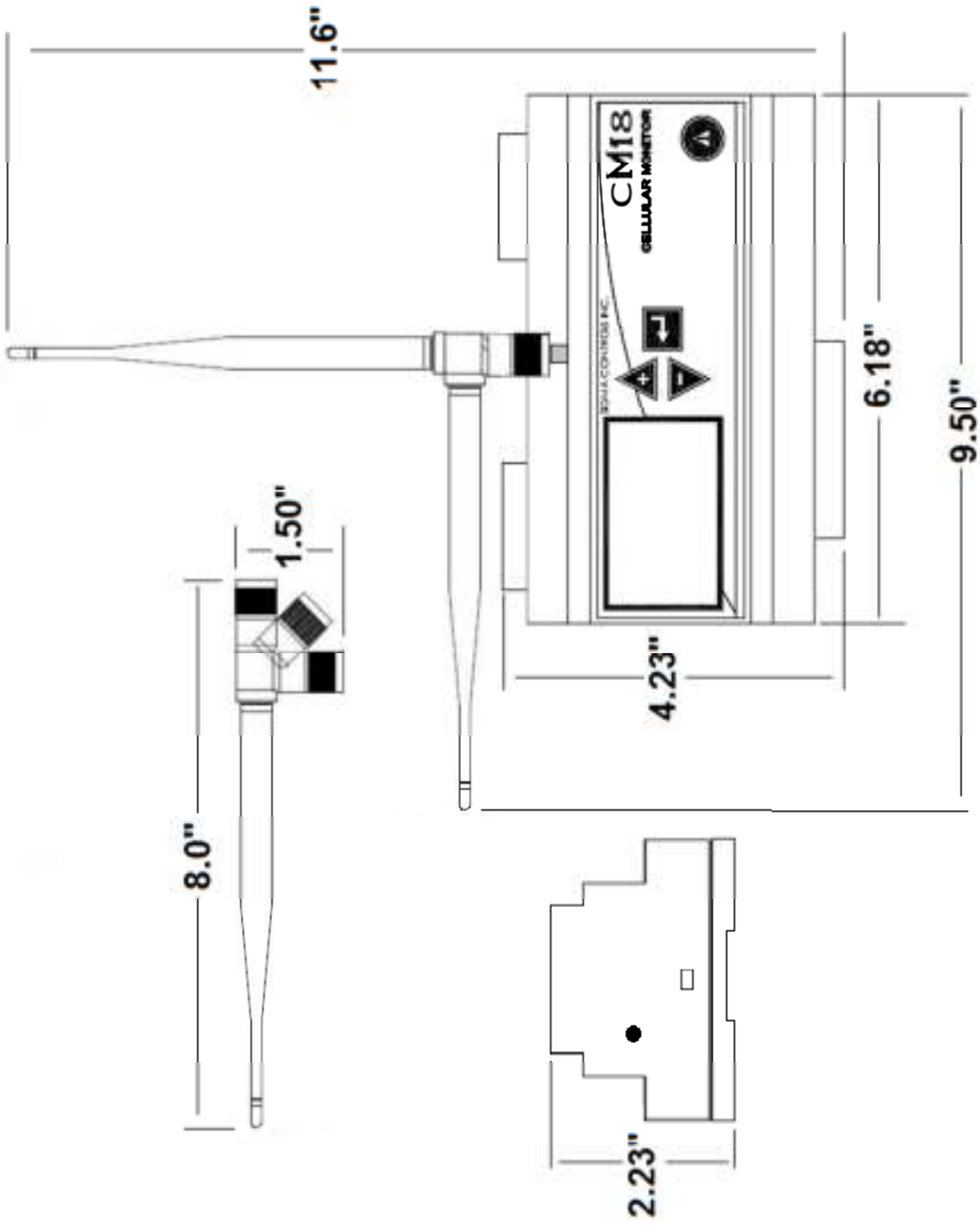
Contact it any time for status update. Text to it "DATA?" And it will send you a report on alarms and other status flags. It will contact you every day with a report if you wish.

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**.

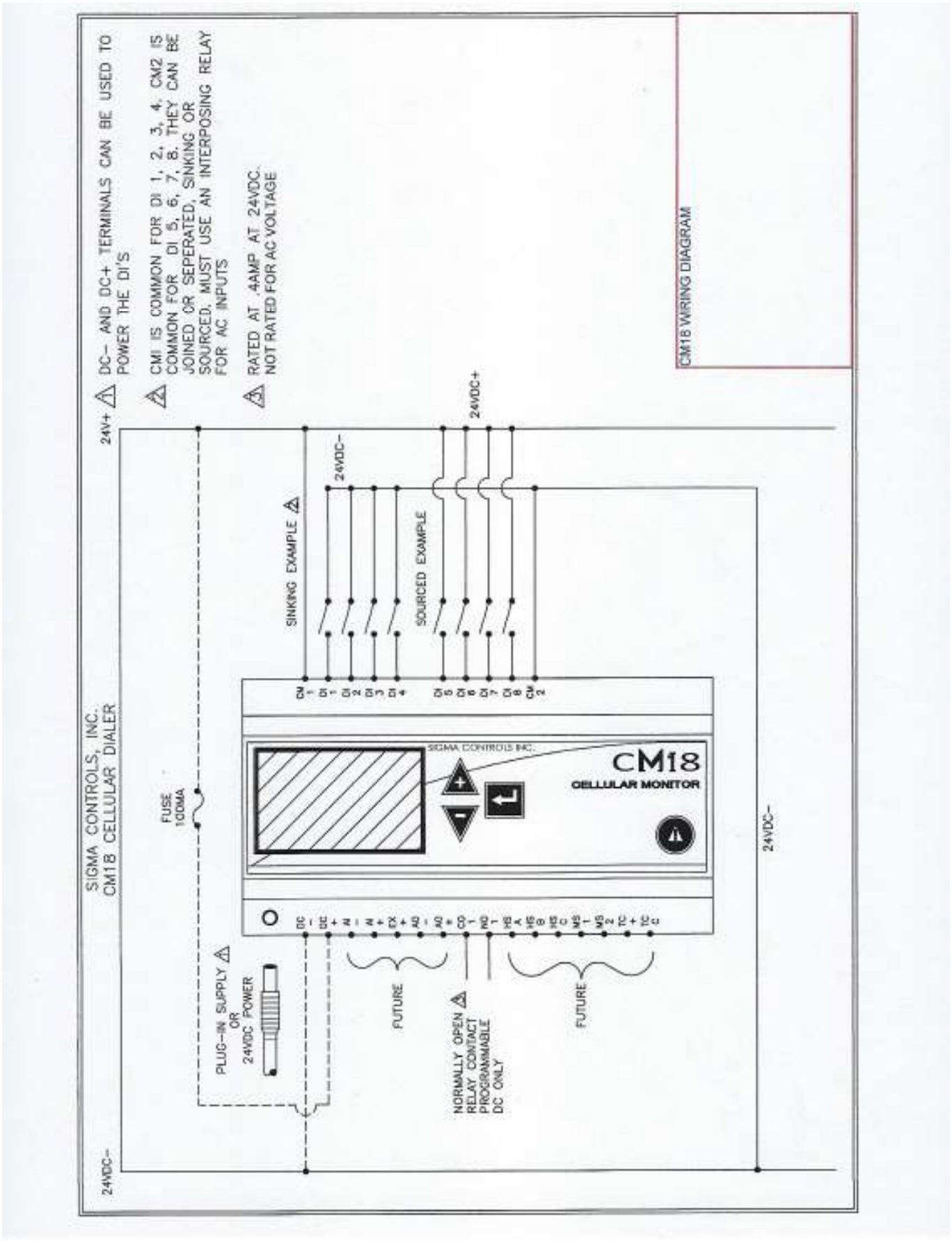
## SPECIFICATIONS

| | |
|---|---|
| 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 |

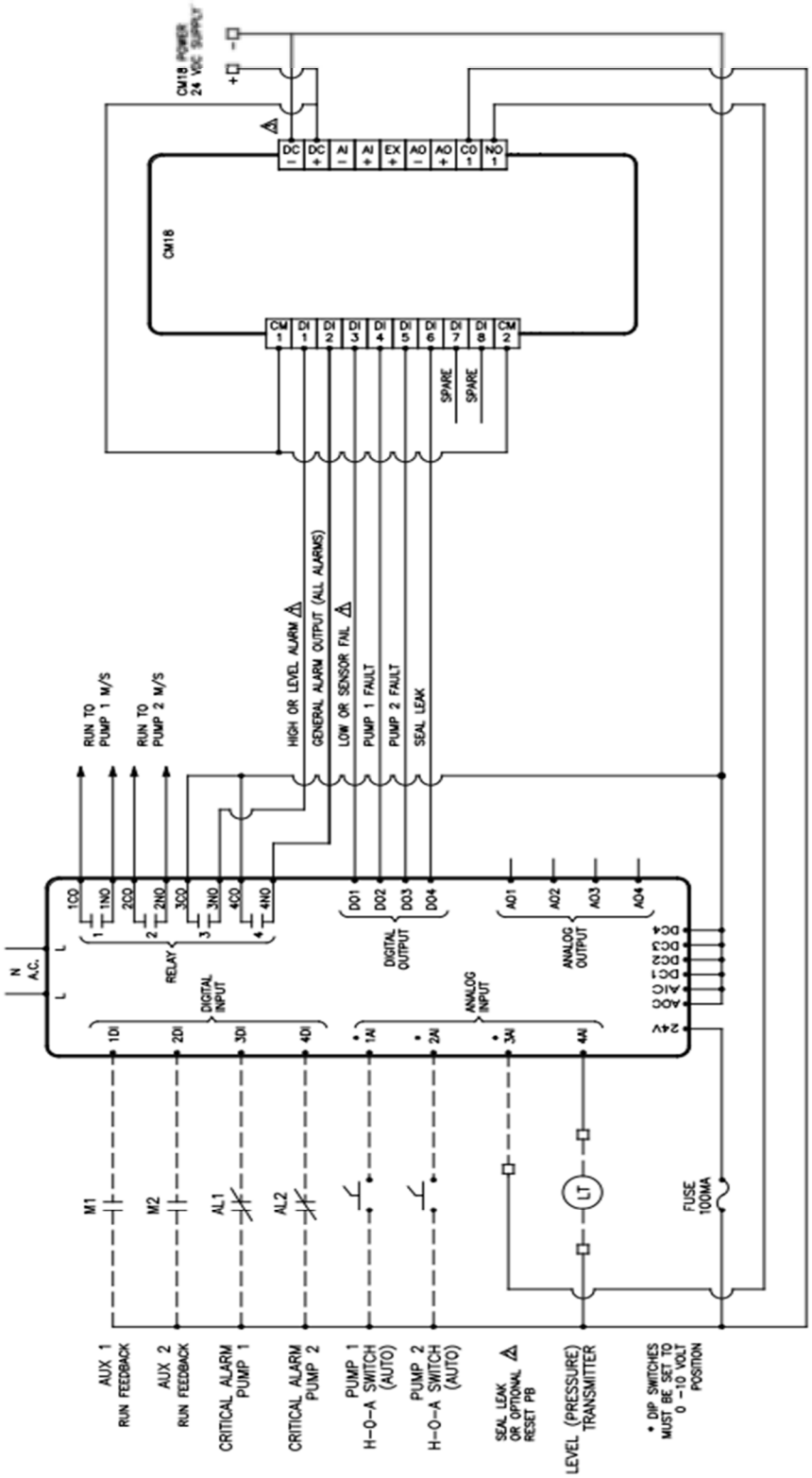
**MECHANICAL**



# TYPICAL WIRING DRAWING



# MYRIAD DPC TO CM18 DRAWING

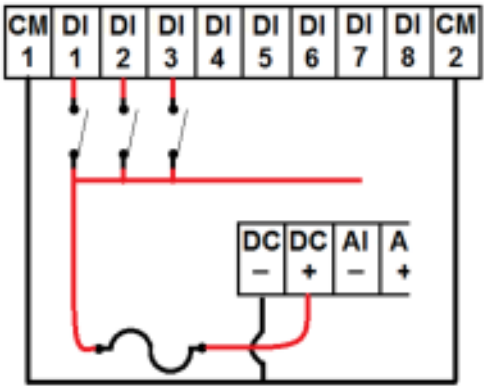


## WIRING CONNECTIONS

Digital Inputs connections

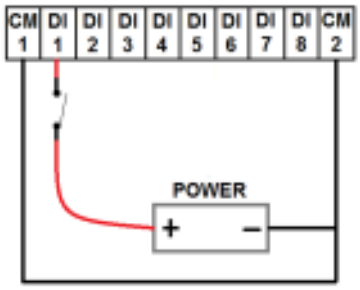
The inputs are grouped together in two sets. CM 1 is the common for 1-4. CM 2 is the common for 5-8. They must be used with DC voltage only, 5VDC -24VDC. The polarity can be either direction, as long as there is a difference of potential between the DI and the common, it will register as a closure. Most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

Connecting dry contacts to the digital inputs.



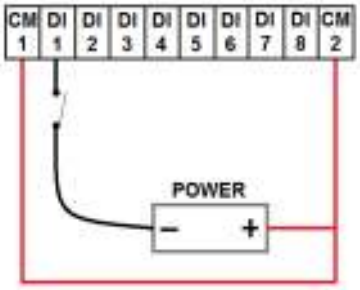

This example uses the 24VDC input terminals to drive the dry contacts from the field.

Connecting a sourced input.



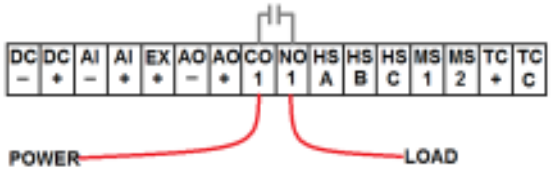

The common is negative. When positive is applied to the input, the indicator on the main screen will darken.

Connecting a sinked input.



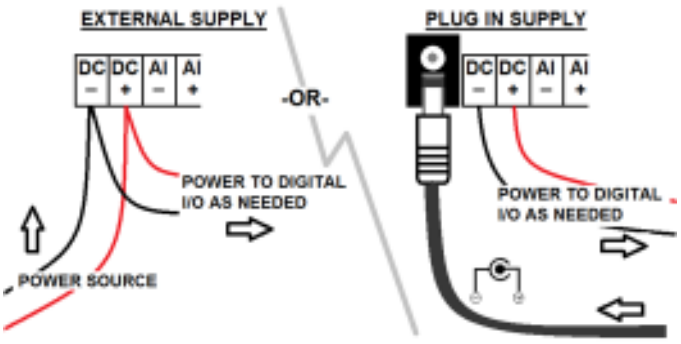

The common is positive. When negative is applied to the input, the indicator on the main screen will darken.

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



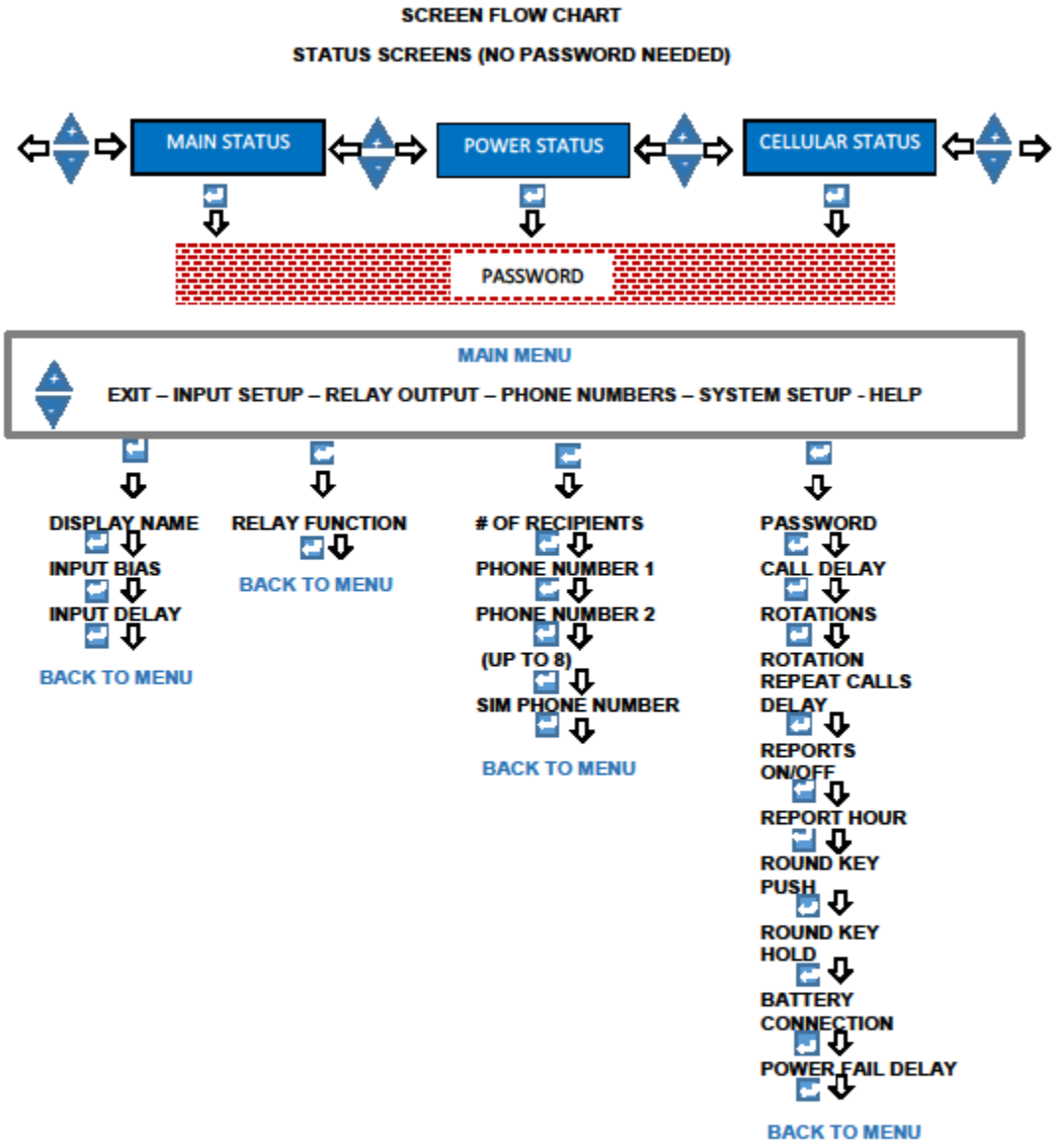

1 AMP at 24VDC is suggested for an external power supply. Our plug in supply is available when ordering.

Sigma Controls, Inc.
Process Controls and Instrumentation

# CM18 SMS MESSENGER TEXT CODES V1.1

| CODE | FOLLOWED BY ? | FOLLOWED BY = | DEFAULT |
|---|---|---|---|
| SITE | READ LOCATION NAME | CHANGE LOCATION NAME | 5TH ST PERKASIE |
| DI01 | READ ALARM 1'S NAME | CHANGE ALARM 1'S NAME | VFD 1 FAULT |
| DI02 | READ ALARM 2'S NAME | CHANGE ALARM 2'S NAME | VFD 2 FAULT |
| DI03 | READ ALARM 3'S NAME | CHANGE ALARM 3'S NAME | VFD 3 FAULT |
| DI04 | READ ALARM 4'S NAME | CHANGE ALARM 4'S NAME | GENERAL ALARM |
| DI05 | READ ALARM 5'S NAME | CHANGE ALARM 5'S NAME | HIGH PRESSURE |
| DI06 | READ ALARM 6'S NAME | CHANGE ALARM 6'S NAME | LOW PRESSURE |
| DI07 | READ ALARM 7'S NAME | CHANGE ALARM 7'S NAME | PUMP FAULT |
| DI08 | READ ALARM 8'S NAME | CHANGE ALARM 8'S NAME | SENSOR FAIL |
| RLY1 | READ THE RELAY'S NAME | CHANGE THE RELAY NAME | RESET PB |
| PH01 | READ 1st RECIPIENT P/N | CHANGE 1st RECIPIENT P/N | 2152573416 |
| PH02 | READ 2nd RECIPIENT P/N | CHANGE 2nd RECIPIENT P/N | 2152573416 |
| PH03 | READ 3rd RECIPIENT P/N | CHANGE 3rd RECIPIENT P/N | 2152573416 |
| PH04 | READ 4th RECIPIENT P/N | CHANGE 4th RECIPIENT P/N | 2152573416 |
| PH05 | READ 5th RECIPIENT P/N | CHANGE 5th RECIPIENT P/N | 2152573416 |
| PH06 | READ 6th RECIPIENT P/N | CHANGE 6th RECIPIENT P/N | 2152573416 |
| PH07 | READ 7th RECIPIENT P/N | CHANGE 7th RECIPIENT P/N | 2152573416 |
| PH08 | READ 8th RECIPIENT P/N | CHANGE 8th RECIPIENT P/N | 2152573416 |
| SIM# | READ SIM CARD'S P/N | ENTER THE SIM CARD'S P/N | FOR REFERENCE |
| DATA | SENDS AN UPDATE | N/A | N/A |
| STOP | ACKNOWLEDGE ALARM | ACKNOWLEDGE ALARM | N/A |
| SETR | N/A | TURNS RELAY OFF/ON | N/A |
| HELP | SENDS HELP MESSAGE | | N/A |
| ENAB | N/A | ARMS SYSTEM | N/A |
| DISA | N/A | DISARMS SYSTEM | N/A |

## PROGRAMING

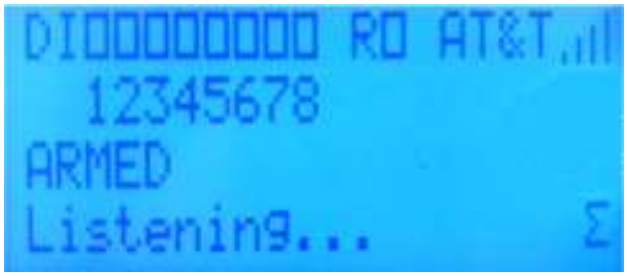

SCREEN FLOW CHART
STATUS SCREENS (NO PASSWORD NEEDED)
MAIN STATUS
POWER STATUS
CELLULAR STATUS
PASSWORD
MAIN MENU
EXIT – INPUT SETUP – RELAY OUTPUT – PHONE NUMBERS – SYSTEM SETUP - HELP
DISPLAY NAME
INPUT BIAS
INPUT DELAY
BACK TO MENU
RELAY FUNCTION
BACK TO MENU
# OF RECIPIENTS
PHONE NUMBER 1
PHONE NUMBER 2
(UP TO 8)
SIM PHONE NUMBER
BACK TO MENU
PASSWORD
CALL DELAY
ROTATIONS
ROTATION REPEAT CALLS DELAY
REPORTS ON/OFF
REPORT HOUR
ROUND KEY PUSH
ROUND KEY HOLD
BATTERY CONNECTION
POWER FAIL DELAY
BACK TO MENU

## 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 Help Menu for the SMS parameters. 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.



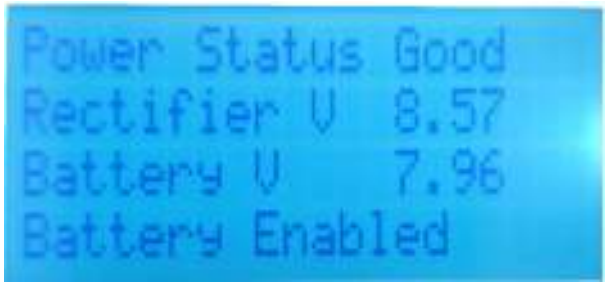

This is the screen that is displayed at the end of the power up and cellular connection sequence. Starting from the upper left, we show the state of the digital inputs. An unfilled block ☐ indicates an open input. A filled block ■ indicates a closed input. The numerals below are just a legend. The R☐ indicates that the relay is de-energized. The carrier is shown as AT&T and the signal strength is shown to be full. The unit is ARMED meaning ready to execute an alarm notification. Listening… means the SMS communication is waiting for an incoming message.
On the bottom right a Sigma character blinks to indicate the CPU is running.

## 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.

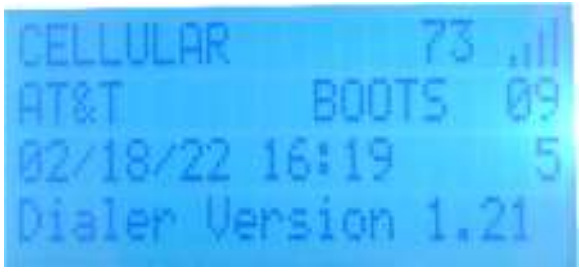
The function of the ⚠ key is programmable but it is commonly used to acknowledge an alarm locally. Holding the key might disarm the system.
Pressing the Up or Down keys from the main screen will display the next status screen. Various status screens are used to show the state of the system without allowing 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 ⚠ key can also be used to exit back to the status screens.

## POWER STATUS




The top line shows the status of the power failure procedure. There are several steps the unit goes through from input power fail to low battery to shutdown to restore.
The Rectifier V is an indication of incoming power but only after it has been stepped down some. Normal is above 8.0V
Battery V is an indication of the battery voltage. Normal is above 7.0V
There is an internal switch that disconnects the battery for shipping. The bottom line shows its state.

## CELLULAR CONNECTION STATUS

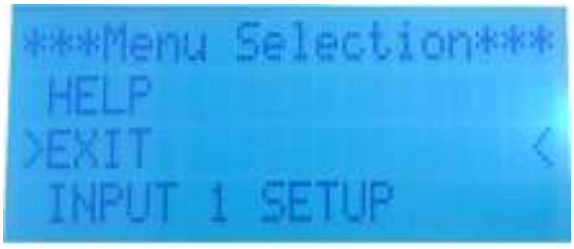


The top line shows the status of the db level. 57 means -57 db. 4 bars indicated a good signal like any cell phone would.
The carrier is defined on the second line.
The time is indicated on the 3rd line. It is pulled from the cell tower so clock adjustment is not needed ever.
The bottom line shows the software version of the unit.

## PASSWORD


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

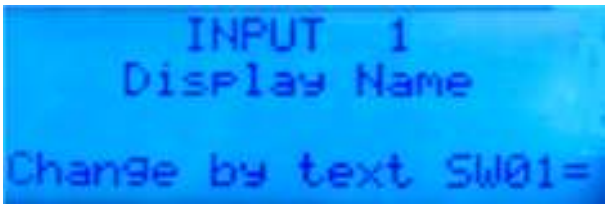
## MAIN MENU




**INPUT 1-8 SETUP**
Model each digital input's parameters for activation.
**RELAY OUTPUT**
Optional and advanced functions can be selected here.
**PHONE NUMBERS**
Shows the recipients of the messages' phone numbers and the dial out sequence.
**EXIT**
Returns you to the status screen.
**SYSTEM SETUP**
Configuration of setting common to all inputs.
**HELP**
Sets Relay on and off points.
SMS Codes & Relay
Whenever exiting to the status screen, all of the settings will be saved.

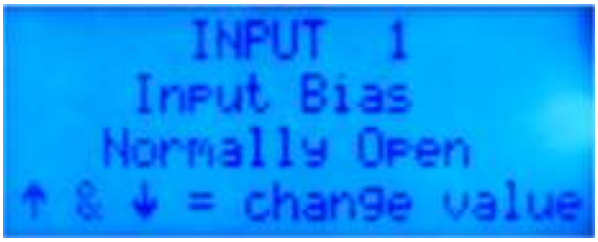
## INPUT 1 SETUP

**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". The default name is HIGH ALARM (not case sensitive). To match our Myriad DPC's first alarm output.
Press enter to go to the next screen.

**Input Bias**



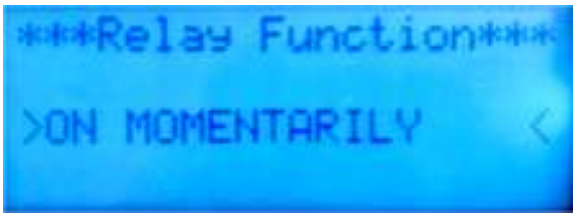

Use the up and down keys to select normally open or normally closed.
Normally open means when the DI is closed, channel 1 will activate.
Press enter to go to the next screen.

**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.

## RELAY SETUP

### Relay Function




There is one normally open contact. It can be programmed to actuate based on one of the following input scenarios.

ALARM X (1-8) You can choose to have it actuate on one particular input.
GENERAL ALARM Any alarm will close relay.
GENERAL ALM NC Any alarm will close relay.
HORN OR BEACON Actuates on any alarm

and can be acknowledged by pushing the ⚠ key or texting “STOP=”
ON MOMENTARILY Closes for short time when receiving the “SETR=” command via text.
OFF MOMENTARILY Opens for short time when receiving the “SETR=” command via text.
REMOTE OFF/ON Toggles the relay when receiving the “SETR=” command via text.
Press enter to go to the next screen.

## PHONE NUMBERS

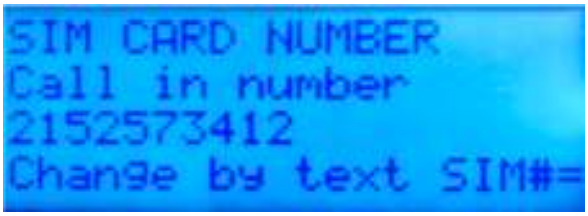
### Number of Recipients


This number is calculated internally based on how many of the 8 phone numbers are 10 digits long. These good phone numbers must be consecutive, starting at the first one.
Press enter to go to the next screen.

### Phone Number


Entering alphanumeric characters with just an up and down key would be tedious. So you **MUST** text the phone numbers in using the syntax; “PH01=2152573412 (not case sensitive). Repeat for each person that will need to be contacted on an event.
Press enter to view the next phone number. If it skips over some phone numbers, then they were not entered as 10 digit phone numbers. You can check the numbers by texting “PH01?” or “PH02?” etc.

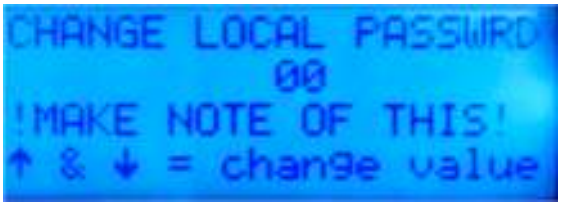
### SIM Card Number




This is texted in. It is not read from the SIM card internally. Text “SIM#=XXXXXXXXXX” to change it. It is for reference locally.
Press enter to go to the main menu

## SYSTEM SETUP

### Local Password

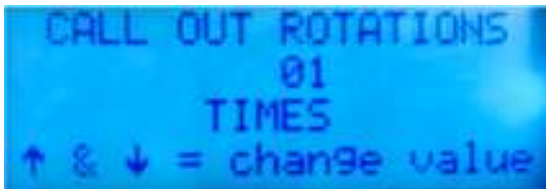



Set a new password.
This password is used to protect these screens from unauthorized access. MAKE NOTE OF ANY CHANGE TO THIS PASSWORD.
Press enter to go to the next screen.

### Inter-call Delay

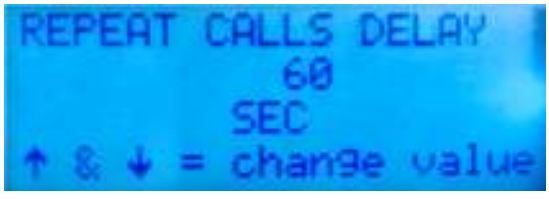

When an alarm is activated the alarm text will be sent to the first recipient (PH01). If PH02 is 10 digits, it will call PH02 after the inter call delay. This procedure will stop notifying people if the ⚠ Key is pushed or someone responds by texting “STOP=”. In other words, it is the time between texting people.
Press enter to go to the next screen.

### Call Out Rotations




When all of the numbers have been messaged and no acknowledge or “STOP=” command is received, that is one rotation. You can set this parameter to message all of them again. As many rotations as desired.
Press enter to go to the next screen.

### Repeat Calls Delay




This parameter sets the delay between rotations.
Press enter to go to the next screen.

### Daily Reports


Daily reports can be sent to the recipients to give status on the site and let you know the CM18 is still monitoring. Save these texts to act as a data log of the site.
Press enter to go to the next screen.

### Daily Report Hour

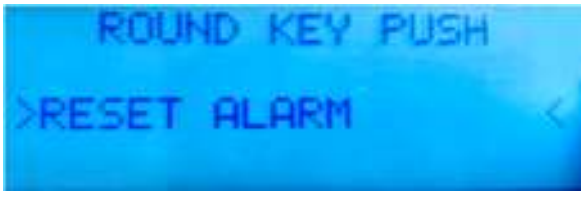

Select the hour of the day to send a report. This is in military time.

Military Time Conversion

| | | | |
|---|---|---|---|
| 1:00 a.m. | 0100 | 1:00 p.m. | 1300 |
| 2:00 a.m. | 0200 | 2:00 p.m. | 1400 |
| 3:00 a.m. | 0300 | 3:00 p.m. | 1500 |
| 4:00 a.m. | 0400 | 4:00 p.m. | 1600 |
| 5:00 a.m. | 0500 | 5:00 p.m. | 1700 |
| 6:00 a.m. | 0600 | 6:00 p.m. | 1800 |
| 7:00 a.m. | 0700 | 7:00 p.m. | 1900 |
| 8:00 a.m. | 0800 | 8:00 p.m. | 2000 |
| 9:00 a.m. | 0900 | 9:00 p.m. | 2100 |
| 10:00 a.m. | 1000 | 10:00 p.m. | 2200 |
| 11:00 a.m. | 1100 | 11:00 p.m. | 2300 |
| 12:00 p.m. | 1200 | 12:00 a.m. | 2400 |

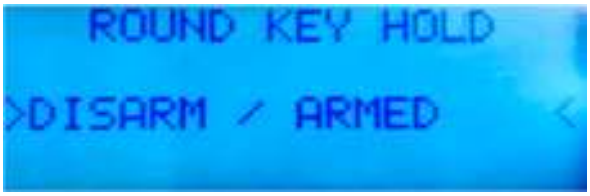
Press enter to go to the next screen.

### Round Key Push




Select the function of the round push button. This is commonly set as “RESET ALARM” or acknowledge.
Press enter to go to the next screen.

**Round Key Hold**




Select the function of the round push button when it is held for a few seconds. This is commonly set as “ARM - DISARM”. This function will toggle the ARMED state of the CM18. You may wish to disarm the unit when performing maintenance. Just don’t forget to arm the system when you are done. Use the up and down key for other selections that will automatically re-arm the system after a few hours.

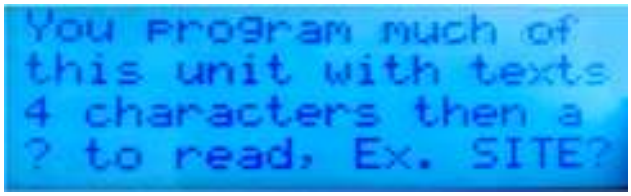
**Battery Connection**


Set to OFF when shipping or storing so the battery does not drain down.
Press enter to go to the main menu.

**POWER FAIL DELAY**


Press enter to go to the main screen.

**HELP**



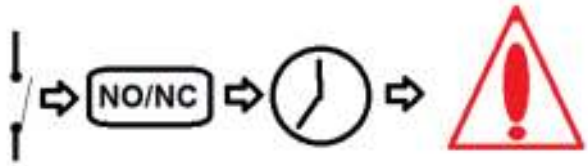

Several screens worth of information is provided to help someone who is local to the CM18, It lists the SMS command codes and explains how to use them.
Press enter to go to the next screen.

**POWERING DOWN**

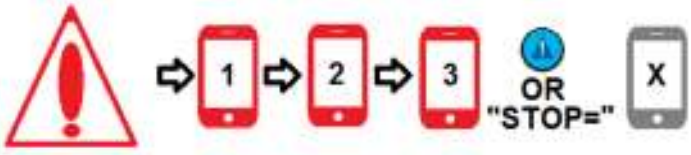
There are two options for turning off this unit. Since it has a battery backup, the power is always on. If external power has been removed, you can push the button on the left side via the access hole. You can also turn the battery connection off in the Setup Menu. Either of these will disconnect the battery electronically. The battery connection will be restored when external power is restored.

**FUNCTION**

When the input changes state, it is biased by the normally open / closed selector, then delayed before tripping an alarm.




When the alarm is tripped it messages recipients until acknowledged.




**POWER FAILURE**

When the incoming power is lost, a text will go out to each recipient. The battery should keep the CM18 alive for at least an hour, depending on power usage. If the power remains off, eventually it will drain the battery. Eventually it will send a low battery message and save all of the settings. When the battery drops far enough the battery connection will be disconnected, powering down the CM18 and saving the battery from being drained to zero volts.

## 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 | | | | | | | | | |
| **MOUNTING** | | | | | | | | | |
| DR = DIN RAIL MOUNT | | | | | | | | | |
| N4 = NEMA 4 ENCLOSURE | | | | | | | | | |
| **POWER** | | | | | | | | | |
| PL = PLUG IN POWER SUPPLY | | | | | | | | | |
| PS = UNWIRED POWER SUPPLY | | | | | | | | | |
| **I/O** | | | | | | | | | |
| 8 = NUMBER OF INPUTS | | | | | | | | | |
| 1 = NUMBER OF OUTPUTS | | | | | | | | | |
| **ANTENNA** | | | | | | | | | |
| INT = ANTENNA ON CM18 | | | | | | | | | |
| X3 = WITH 3 FOOT EXTENSION | | | | | | | | | |
| X6 = WITH 6 FOOT EXTENSION | | | | | | | | | |
| X12 = WITH 12 FOOT EXTENSION | | | | | | | | | |
| X25 = WITH 25 FOOT EXTENSION | | | | | | | | | |
| **SIM CARD** | | | | | | | | | |
| ATT= WITH AT&T SIM CARD | | | | | | | | | |
| VZN = WITH VERIZON SIM CARD (FUTURE) | | | | | | | | | |
| TMO = WITH T-MOBLE SIM CARD | | | | | | | | | |
| **RS485 COMMUNICATION** | | | | | | | | | |
| 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.

REVISION HISTORY

V1.0 – (01/27/2020) Launch,.8 DI, 1 Relay

Sigma Controls, Inc.
PROCESS CONTROLS AND INSTRUMENTATION

# 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.

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