

# ProTalk

# FLO

## Installation & Operation Manual

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## **1. INTRODUCTION**

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The ProTalk FLO, model B1281, is a device used to monitor a tank level at an unattended site and control up to two pumps to maintain the fluid level in the tank. It can also be used to monitor for alarms at this site and report any alarm conditions over a cellular network or two-way radio system.

The initial configuration of the ProTalk FLO is accomplished using a dedicated PC application. Some operational changes can subsequently be made using a local programming telephone or by remotely calling in to the unit. When using either; a local or remote telephone for programming, the unit prompts you, step-by-step, for new entries using spoken phrases and speaks back all the values you have entered.

The sections in this manual show the installation and operation of the ProTalk FLO as well as instructions for downloading a database from an attached computer and further programming using the keypad on your telephone.

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## 2. BEFORE YOU BEGIN

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The FLO is a pump controller and alarm reporting unit with an embedded cellular transceiver. Included with this device are the following:

- 16 pin terminal block for wiring alarm inputs
- 16 pin terminal block for wiring alarm outputs/radio/power
- USB cable for PC programming
- Dipole Antenna
- Programming software CD-ROM
- SMA to TNC Antenna Adapter

### System Requirements

The FLO is designed to operate on a HSPA network. In order to operate on a wireless network, you will require an account and a SIM card from a local wireless provider.

Additionally, to program the FLO and the embedded transceiver, the following is required:

- Standard telephone set with DTMF keypad, and
- Personal Computer with CD Drive and USB port running Windows 98/2000/XP/7

### Registering the Cellular Transceiver

To program the embedded cellular transceiver for use on the HSPA network, you will need to obtain a Mobile Identification Number (MIN) from your wireless provider. In order to get a MIN, you will need to provide them with the following information:

- SIM Card Number – included in the accessory bag
- Installed “home” location – establishes the local calling region
- A billing contact name and address

SIM Card (19 or 20 digits): \_\_\_\_\_

MIN (10 digits): \_\_\_\_\_

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### 3. POWER REQUIREMENTS

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The FLO requires a DC power supply voltage between +12 to +24 Volts. This supply should be capable of delivering up to 1 Amp of current. Connect your DC power source to the Ground (GND) and Positive (PWR) terminals on the terminal block.

#### **Optional Internal Battery Backup**

When the FLO is equipped with the optional internal battery backup, it will continue to function without primary power. The life of the battery is dependent on unit operations and call outs during the power outage. Should the battery voltage drop below +9 Volts, the FLO will disconnect and shutdown. The internal battery backup is intended as a fail safe during power outages and should only be used as a temporary means to provide power to the unit.

The internal battery charger operates with input voltages between +8 and +30 volts DC. The internal battery is limited to 1.4Ahr; if you require a larger battery capacity, please contact our sales office for alternative battery options.

Since a FLO equipped with an internal battery will continue to function in the absence of primary power, a means of manually shutting the system off has been provided. This feature is used when servicing or relocating the unit. The shutdown switch is located next to the DB9 programming connector. A forced shutdown can only be done when the primary power is absent. Press and hold the shutdown switch for five seconds to force the FLO into shutdown mode. After five seconds, the internal battery will be disconnected and the unit will not be operational. The FLO will return to the operational state when the primary power is applied again.

The internal battery option is not recommended for applications requiring low power consumption.

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## 4. INSTALLATION

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The B1281 FLO should be installed in a clean, dry location suitable for electronic equipment.

*Caution: Power and antenna cables should be connected only after the installation is complete.*

In order to communicate with neighbouring cellphone towers, you will need to attach an antenna to the FLO. The air interface for this phone is an SMA connector on the side of case.

A dipole antenna was included in the purchase of this product. This antenna is suitable for indoor use only and is limited in its range. Please contact our sales office if your needs exceed the limits of this antenna, as we may be able to supply or recommend an appropriate substitute.

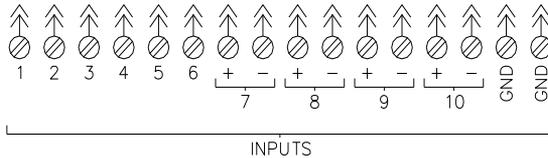
### **Installation using a two-way radio or public address system**

The radio port provides the interface to a customer supplied mobile radio base station. It can also be connected to a public address system. This port supports outgoing (TX) audio, incoming (RX) audio, a push-to-talk (PTT) line to control the transmitter and a carrier operated switch (COS) line to monitor if the radio system is busy. Both audio lines are single ended and have independent level controls. The PTT line is an open collector driver. The COS line uses a ground closure to sense activity and can be programmed for either normally open or normally grounded operation.

## Wiring Your Inputs

### Connections

The FLO has ten inputs for connection to customer alarm signals. Each input can be independently programmed to accept either a digital or analog signal. Refer to Figure 1 for details of the connector pinouts.



**Figure 1 Input Connections**

## Tank Monitoring Inputs

### Float Switch Inputs

There are 5 digital inputs available for monitoring the tank level. In a dual pump configuration with High and Low Alarm backup floats, all 5 inputs are used.

- Input 3 – Low Alarm Level
- Input 4 – High Alarm Level
- Input 5 – Lag Pump Level
- Input 6 – Lead Pump Level
- Input 7 – All Off

If you are operating a single pump application, Input 5 is not used. See the section on Other Digital Alarm Inputs for more information on digital inputs.

### Analog Transducer Inputs

When using an analog transducer, Input 7 is used to monitor the tank level.

Float switches can also be added in the Low (Input 3) and High (Input 4) positions as a fail safe to the analog transducer. See the section on Other Analog Alarm Inputs for more information on analog inputs.

## Pump Configuring Inputs

### Run Status Inputs

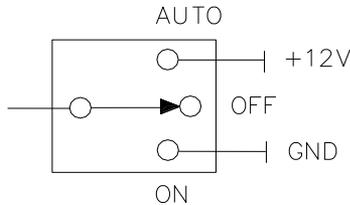
Inputs 1 and 2 are used to monitor the physical operation of Pumps 1 & 2 respectively.

### Pump Overload Inputs

Inputs 8 & 9 are capable of monitoring critical conditions of the pump. Digital (temperature, leak) or analog (current) inputs may be used.

### Pump Hand-Off-Auto Input

Input 10 is used to for connection to the Hand-Off-Auto (HOA) control for both pumps.



**Figure 2 HOA Input**

### Alternate configurations

The HOA controls Input 10. It can, alternatively, be connected to Inputs 5 & 6 or Inputs 8 & 9 to control each pump separately when these inputs are not used for other purposes.

### Other Digital Alarm Inputs

When programmed for digital operation, the high (or open) state is provided by a switched internal pullup resistor connected to a +5 volt source. The low state is when the input voltage is below +2 volts. For most applications, this is done by a closure to ground using either a relay contact. A voltage source can be used for a digital alarm provided it can go below the +2 volt threshold and sink 1 mA. A voltage signal of up to +36 volts can be used without damaging the input. Do not connect AC voltage sources of any type to the inputs. For digital operation, connect the signal to the single terminal for inputs 1 through 6 or the + terminal for inputs 7 through 10. Technical drawings have been provided on page 44 for your reference.

In addition to the standard detection of an alarm state at the input, a digitally formatted input can also be configured as a watchdog type of alarm, or as non-alarm types: totalizer, accumulator or pulse width. A watchdog alarm type requires a periodic refresh signal to prevent an alarm condition; a totalizer type counts the changes at the input; an accumulator stores the total time that the input is active and a pulse width measures the duration of an active input. These three non-alarm types (totalizer, accumulator & pulse width) do not generate alarms and must be interrogated to recover the reading.

Each change to a totalizer or accumulator count is stored in non-volatile memory. If a power loss or system restart occurs, the stored count will be recovered from memory and the count will continue without interruption. Note that, in the event of a power loss, any activity that occurred during the outage will not be recorded.

### **Other Analog Alarm Inputs**

All ten inputs can be programmed for monitoring analog voltage signals. Two programmable ranges are available: 0 to +5 volts DC and 0 to +30 volts DC. For analog voltage operation, connect the signal to the single terminal for inputs 1 through 6 or the + terminal for inputs 7 through 10.

Inputs 7 through 10 are also capable of accepting 4-20 mA analog signals. When programmed for analog current operation, the + side of the loop is connected to the + terminal and the negative side to the – terminal. Technical drawings have been provided on pages 44 & 45 for your reference.

### **Internal Monitoring**

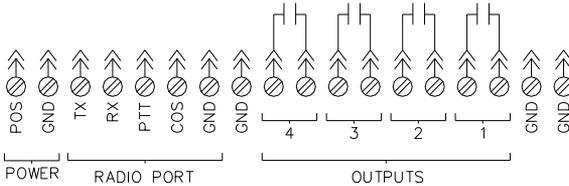
The incoming DC power supply is monitored as alarm 11. It has a full scale range of 30 volts.

Input 12 monitors for internal errors in the device.

## Wiring Your Outputs

There are four relays available for pump control or general relay outputs.

Refer to Figure 2 for details of output pinouts



**Figure 2 Output Connections**

### Pump Control Outputs

The first two relay outputs, defined as “Pump 1” and Pump 2” are used to control Pumps 1 & 2 respectively. If one relay is required for each state (on & off) then Aux 3 & 4 will be used to provide the “off” function to the pump.

### General Relay Outputs

Relay outputs 3 and 4 can be programmed for either remote control or to indicate internal status of the FLO. Internal status can be programmed as an acknowledgement received indicator or as an alarm present indicator. When used for status indicators, specific relays are assigned as follows:

- Relay 3 Acknowledge Received
- Relay 4 Any Alarm

The contacts of the first two relays used for pump control are open when idle and close to start the pump. The contacts for the general relay outputs can be set as either normally open or normally closed through programming.

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## 5. PROGRAMMING

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### Programming With A PC

In order to program your FLO using a PC, you will need to install the appropriate programming software. A complimentary copy of our Windows-based software was included in the purchase of the product. Simply insert the disk into your CD/DVD ROM drive and follow the InstallShield instructions. Be sure to keep the disk in the drive until your initial programming is complete.

Once the installation of the programming software is complete, you will need to connect your FLO to your PC. Two data connectors are provided for programming and monitoring the FLO: an RS232 port using a DB9 male connector and a USB type B connector. Do not use both at the same time.

If you are using the USB connection, you will need to install the drivers found on the installation CD. The Found New Hardware Wizard will ask you if you want Windows Update to search for software; select *“No, not at this time”*. You will then be prompted for an installation CD. This is the software that was provided to you and should still be in your drive. Select *“Install the software automatically”*. Confirm the hardware selected is CP2101 USB Composite Device. Select *“Next”*. Finally, Windows may ask for authorization to continue without Logo testing. Select *“Continue Anyway”*. You will need to go through this process twice to install the drivers.

Now that your software and drivers are installed, you are ready to program your unit.

Simply double click the BE shortcut on your desktop or follow your start menu to All Programs and select Barnett Engineering. This will open up a generic folder containing information for all of our products. You will find the FLO Configuration Software in the B1281 FLO folder. Select this executable and it will open the programming software. All information pertaining to the software can be found within the Help files of the FLO Configuration Software.

## Programming With A Handset

The ProTalk FLO is capable of recording voice messages and limited database programming using a TouchTone telephone; either locally through the programming port or remotely by calling in to the unit.

### Local Programming

A standard RJ11 Telephone jack has been provided. This port accepts a standard TouchTone telephone set and is used to record voices or perform basic, programming tasks. **DO NOT PLUG A TELEPHONE LINE INTO THIS PORT**

To begin a local programming session, lift the handset to your ear.

The ProTalk FLO has stored voice prompts to guide you through the programming session. The first message you will hear is "Enter Command Code" followed by a pause, and then, "Enter Program Code". Refer to the Handset Programming Codes on Page 11 for a list of Program Codes and the subsequent pages for instructions on programming each section.

### Remote Programming

For a remote session, call in to the ProTalk FLO from your TouchTone telephone set.

When answering an incoming call, this unit responds depending on the previously programmed Security Level setting:

- Level 1: The call will be answered with a message containing the Site ID, followed by the prompt "Enter Command Code". An Access Code is not required.
- Level 2: The call will be answered with a message containing only the Site ID. To advance any further the caller must enter the Access Code within 10 seconds.
- Level 3: The call will be answered with the device emitting short beeps. To advance any further the caller must enter the Access Code within 10 seconds.

If the unit's security level is set to Level 1, or the Access Code was successfully entered, the ProTalk FLO will say "Enter Command Code" and then pause for several seconds. If the Access Code is entered again, or the Access Code is blank, the unit will enter the programming mode and speak "Enter Program Code". At this time you can enter your program codes using the Handset Programming Codes on Page 11.

## Handset Programming Codes

The codes used in the main programming menu are given as a summary below. If no keys are pressed for five seconds, the FLO will announce the menu choices.

- 0[\*][\*] Cellphone Programming (page 12)
- 1[\*][\*] Voices (page 13)
- 2[\*][\*] Directories (page 14)
- 3[\*][\*] General Site Configuration (page 16)
- 4[\*][\*] Input Configuration (page 18)
- 5[\*][\*] Output Configuration (page 21)
- 6[\*][\*] Acknowledge Configuration (page 23)
- 7[\*][\*] Radio Configuration (page 24)
- 9[\*][\*] Cellphone Status (page 25)
- 11[\*][\*] Tank Settings (page 26)
- 12[\*][\*] Pump Control (page 27)
- 13[\*][\*] Pump Configuration (page 28)
- \*[\*][\*] Query Version (page 29)

## **0\*\*** **Cellphone Programming**

While most of the HSPA module parameters are configured at the factory, the module does require a Mobile Identification Number (MIN) to operate on the network. In order to obtain a MIN from your wireless service provider, you will need to provide them with the Electronic Serial Number (ESN) of the unit. The Phone Control is a parameter predefined by the cellular service provider and is automatically programmed into the module. Contact Barnett Engineering Technical Support prior to changing this parameter.

FLO: "Program Phone"

FLO: "SIM Card Number is....."  
+19 or 20 digit number

You: **#\*\*** Exit to Main Menu  
**\*\*** Next item

FLO: "Mobile Number is....."  
+10 digit number

You: **X\*\*** Enter a new 10 digit number  
**#\*\*** Exit to Main Menu  
**\*\*** Next item

**1\*\* Voices**

FLO: "Program Voice"

FLO: "Enter Voice Code"

You: **1\*\*** Playback or record voices for Site Name  
**2\*\*** Playback or record voices for all inputs  
**3\*\*** Playback or record voices for all outputs  
**4\*\*** Pump control voices  
**5\*\*** Erase all voices  
**#\*\*** Exit to Main Menu  
**\*\*** Exit to Main Menu

**Playback or Record Voices**

FLO: "Site is" *"Ajax Lift Station"*  
 or "Input 8 is" *"High Temperature"*  
 or "Output 3 is" *"Yard Lights"*  
 or Pump Control Voices:  
 "Tank input is..."  
 "Pump Overload 8 is..."  
 "Pump Overload 9 is..."  
 "HOA Switch 10 is..."  
 "Output 1 is..."  
 "Output 2 is..."

You: **2\*\*** Record new voice  
**#\*\*** Exit to voice menu  
**\*\*** Accept current recording and advance to next voice

**Recording:**

FLO: "beep"  
 You: *"Acme Lift Station"* (Recording stops with silence)  
 FLO: "Site is" *"Acme Lift Station"*

**Erase All Voices:**

FLO: "Alert, Enter Octo Three One Star Star"  
 You: **#31\*\***  
 FLO: "Voices are empty"

## 2\*\* Directories

FLO: "Program Directory"

FLO: "Directory Line 1 is..."

### Directory Line

Refer to the command list that follows for the available directory entries.

FLO: "On Shift 1, Directory Line 1 is DIAL"

or "Directory, Line 1 is DIAL 4032559544 VOICE"

You: **2\*\*** Edit current line  
**3\*\*** Erase current line  
**4\*\*** Insert line  
**\*\*** Next line  
**#\*\*** Exit to Directory Menu

### Edit current line

FLO: "beep"

You: **#04031234567#8\*\***  
 (new line is DIAL 4031234567 VOICE)

or **4031234567\*\***  
 (new line is DIAL 4031234567 VOICE)

### Insert new line

FLO: "beep"

You: **#1#8\*\***  
 (new line is RADIO VOICE)

## Directory Commands

Directory programming requires you to enter a sequence of digits that corresponds to a directory line in the PC programming. All of the commands that would appear on that line have to be entered with one string ending in **\*\***. Each command consists of a **#** digit followed by the digit representing the command followed by digits representing the value (if needed). The list below shows the sequence of digits used to enter the commands and values; the value portion is shown as a single **X** and will vary depending on the command it is following.

## Quick Commands

<b>(X)(*)(*)</b>	DIAL & VOICE	<b>(X)</b> is the telephone number.
<b>(#)(1)(*)(*)</b>	RADIO, ALERT & VOICE	
<b>(#)(2)(X)(*)(*)</b>	WAIT	<b>(X)</b> is the time in seconds (< 255)
<b>(#)(9)(X)(*)(*)</b>	SMS TEXT	<b>(X)</b> is the data phone number.

## Custom Sequences

Custom sequences are created by selecting a prefix to define the port, followed by one or more commands and ending in a **(\*)(\*)** suffix.

### Prefix Options

<b>(#)(0)(X)</b>	DIAL	<b>(X)</b> is the phone number.
<b>(#)(1)</b>	RADIO	

### Command Options

<b>(#)(2)(X)</b>	WAIT	<b>(X)</b> is the time in seconds (< 255)
<b>(#)(3)</b>	ALERT	
<b>(#)(4)(X)</b>	2 TONE	<b>(X)</b> is the paging frequencies with an assumed decimal before the last digit with a <b>(*)</b> separating them. <b>(1)(2)(3)(4)(5)(*)(6)(7)(8)(9)</b> will give the A/B paging tones 1234.5/678.9.
<b>(#)(5)(X)</b>	5 TONE	<b>(X)</b> is the 5 tone paging code a <b>(*)</b> used to separate the preamble from the code. <b>(*)(2)(3)(4)(5)(6)</b> will give the code 23456 with preamble.
<b>(#)(7)(X)</b>	DTMF digits.	<b>(X)</b> is the string of DTMF digits.
<b>(#)(8)</b>	VOICE	

Example: **(#)(1)(#)(5)(1)(\*)(2)(3)(4)(5)(6)(#)(3)(#)(8)(\*)(\*)** would transmit 5 TONE paging tones over the RADIO, then generate an ALERT and speak VOICES.

*Note: Command Options 3, 4 & 5 are only available using the radio prefix.*

### **3\*\*** General Configuration

FLO: "Program Site"

FLO: "Acknowledge Timer is . . ."

You: **X\*\*** Enter new value (0 = off, 1 = 30 min, 2 = 60 min,  
3 = 120 min, 4 = 240 min)

**#\*\*** Exit to Main Menu

**\*\*** Next setting

FLO: "Security Level is . . ."

You: **X\*\*** Enter new value (1, 2 or 3)

**#\*\*** Exit to Main Menu

**\*\*** Next setting

FLO: "Access Code is . . ."

You: **X\*\*** Enter new DTMF code

**X\*\*** Erase DTMF code

**#\*\*** Exit to Main Menu

**\*\*** Next setting

FLO: "Auto Report is . . ."

You: **X\*\*** Enter new value (0=disable, 1=enable)

**#\*\*** Exit to Main Menu

**\*\*** Next setting

FLO: "Start Auto Report at . . ."

You: **X\*\*** Enter hour and minute of first auto report time  
0 = not used

4 digit time (eg. 0830)

hours = 01 to 23

minutes = 00, 15, 30. or 45

**#\*\*** Exit to Main Menu

**\*\*** Next setting

FLO: "Report Every . . ."

You: **X\*\*** Enter time between reports

0 + digits = hours (06, 08 or 012 hours)

1 to 7 digits = days (1 = Monday, 2 = Tuesday...)

**#\*\*** Exit to Main Menu

**\*\*** Next setting

FLO: "Auto Report Radio is . . ."

You: **X\*\*** Enter new value (0 = disable, 1 = enable)

**#\*\*** Exit to Main Menu

**\*\*** Next setting

FLO: "Auto Report Phone Number is . . ."

You: \*\* Enter new phone number  
\*\* Erase phone number (disabled)  
\*\* Exit to Main Menu  
\* Next setting

FLO: "Auto Report Text Message Number is . . ."

You: \*\* Enter new destination phone number  
\*\* Erase phone number (disabled)  
\*\* Exit to Main Menu  
\* Next setting

## 4\*\* Input Configuration

FLO: "Program Input"

FLO: "Enter Input Number"

You: \* Select Input 1

•••

\* Select Input 12

\* Exit to Main Menu

\* Select Next Input

### Menu items for Digital Inputs are:

FLO: "Input N Is Digital Input. . ."

You: \* Enter new value

0 = disabled

1 = enabled

\* Exit to Input Menu

\* Next setting

### Menu items for Watchdog Inputs are:

FLO: "Input N Is Watchdog Input . . ."

You: \* Enter new value

0 = disabled

1 = enabled

\* Exit to Input Menu

\* Next setting

FLO: "Timeout Interval is . . ."

You: \* Enter new value

0 to 65535

\* Exit to Input Menu

\* Next setting

### Menu items for Interval Inputs are:

FLO: "Input N Is Interval Input. . ."

You: \* Enter new value

0 = disabled

1 = enabled

\* Exit to Input Menu

\* Next setting

Menu items for Totalizer Inputs are:

FLO: "Input N Is Totalizer Input. . ."

You: (X)(\*)(\*) Enter new value

0 = disabled

1 = enabled

(#)(\*)(\*) Exit to Input Menu

(\*)(\*) Next setting

FLO: "DTMF OFF Code is . . ."

You: (X)(\*)(\*) Enter new DTMF code

1 to 7 digits

(#)(#)(\*)(\*) Erase DTMF code

(#)(\*)(\*) Exit to Input Menu

(\*)(\*) Next setting

Menu items for Accumulator Inputs are:

FLO: "Input N Is Accumulator Input . . ."

You: (X)(\*)(\*) Enter new value

0 = disabled

1 = enabled

(#)(\*)(\*) Exit to Input Menu

(\*)(\*) Next setting

FLO: "DTMF OFF Code is . . ."

You: (X)(\*)(\*) Enter new DTMF code

1 to 7 digits

(#)(#)(\*)(\*) Erase DTMF code

(#)(\*)(\*) Exit to Input Menu

(\*)(\*) Next setting

Menu items for Intruder Inputs are:

FLO: "Input N Is Intruder Input. . ."

You: (X)(\*)(\*) Enter new value

0 = disabled

1 = enabled

(#)(\*)(\*) Exit to Input Menu

(\*)(\*) Next setting

FLO: "Timeout Interval is . . ."

You: (X)(\*)(\*) Enter new value

1 to 250

(#)(\*)(\*) Exit to Input Menu

(\*)(\*) Next setting

FLO: "DTMF Code is . . ."

You:  Enter new string of DTMF digits  
1 to 6 digits

Exit to Input Menu

Next setting

Menu items for Totalizer Inputs are:

Menu items for 5 Volt, 30 Volt, and Current Analog Input Sensors are:

FLO: "Input N Is . . ."

You:  Enter new value  
0 = disabled  
1 = enabled

Exit to Input Menu

Next setting

FLO: "Setpoint High is . . ."

You:  Enter new value  
Enter the new setpoint as a 1 to 4 digit value, the decimal point will automatically be placed according to current program settings (use  for minus). A high setpoint must be within the Decimal Minimum and Maximum and must not be less than the Low Setpoint + Hysteresis value.

Exit to Input Menu

Next setting

FLO: "Setpoint Low is . . ."

You:  Enter new value  
Enter the new setpoint as a 1 to 4 digit value, the decimal point will automatically be placed according to current program settings (use  for minus). A low setpoint must be within Decimal Minimum and Maximum and must not be more than the High Setpoint - Hysteresis value.

Exit to Input Menu

Next setting

## 5\*\* Output Configuration

FLO: "Program Output"

### Menu items for Manual On/Off Outputs are:

FLO: "Output N Type is On Off"

FLO: "DTMF On Code is . . ."

You: \* Enter new code  
#\* Erase On Code  
\* Exit to Main Menu  
\* Next setting

FLO: "DTMF Off Code is . . ."

You: \* Enter new code  
#\* Erase Off Code  
\* Exit to Main Menu  
\* Next setting

### Menu items for Timed On/Off Outputs are:

FLO: "Output N Type is Timed"

FLO: "DTMF On Code is . . ."

You: \* Enter new code  
#\* Erase On Code  
\* Exit to Main Menu  
\* Next setting

FLO: "DTMF Off Code is . . ."

You: \* Enter new code  
#\* Erase Off Code  
\* Exit to Main Menu  
\* Next setting

FLO: "Output Time is . . ."

You: \* Enter new value  
 1 to 65535  
\* Exit to Main Menu  
\* Next Setting

Menu items for the Automatic Timed Output (Relay 3 only) are:

FLO: Output N Type is Automatic"

FLO: "Output Time is . . ."

You: (X)(\*)(\*) Enter new value  
1 to 65535

(#)(\*)(\*) Exit to Main Menu

(\*)(\*) Next Setting

Menu items for Automatic On/Off Outputs (Relay 4 only) are:

FLO: "Output N Type is Automatic"

You: (#)(\*)(\*) Exit to Main Menu

(\*)(\*) Next Setting

**6\*\* Acknowledge Configuration**

FLO: "Program Site"

FLO: "Acknowledge Code is . . ."

You:    Enter a new DTMF code  
   Exit to Main Menu  
  Next setting

FLO: "Interrogate Code is . . ."

You:    Enter a new DTMF code  
   Exit to Main Menu  
  Next setting

FLO: "Directory Timer is . . ."

You:    Enter new value (1 to 255 min.)  
   Exit to Main Menu  
  Next setting

## **7\*\* Radio Configuration**

FLO: "Program Radio"

FLO: "Radio Volume One is . . ." (TX Tone)

You: **X\*\*** Enter a new value (0 to 20)  
**#\*\*** Exit to Main Menu  
**\*\*** Next setting

FLO: "Radio Volume Two is . . ." (TX DTMF)

You: **X\*\*** Enter a new value (0 to 20)  
**#\*\*** Exit to Main Menu  
**\*\*** Next setting

FLO: "Radio Volume Three is . . ." (TX Voice)

You: **X\*\*** Enter a new value (0 to 20)  
**#\*\*** Exit to Main Menu  
**\*\*** Next setting

FLO: "Radio Volume Four is . . ." (Receive)

You: **X\*\*** Enter a new value (0 to 20)  
**#\*\*** Exit to Main Menu  
**\*\*** Exit to Main Menu

**9\*\* Cellular Module Status**

FLO: "Phone Interrogate"

FLO: "Signal Strength is . . ."

0 to 15; 3=poor, 6=good

You: **#\*\*** Exit to Main Menu.  
**\*\*** Next item.

FLO: "Roaming Status is . . ."

0 = Not Roaming, 1 = Roaming

You: **#\*\*** Exit to Main Menu.  
**\*\*** Next item.

FLO: "Band is . . ."

+ 800 or 1900 or empty

You: **#\*\*** Exit to Main Menu.  
**\*\*** Exit to Main Menu.

**1 1 \* \*** Tank Configuration

FLO: "Program Tank Configuration"

FLO: "Low Level Alarm is....."

You: **X \* \*** Enter new value  
0 = disabled  
1 = enabled

**# \* \*** Exit to Main Menu.  
**\* \*** Next item.

FLO: "High Level Alarm is....."

You: **X \* \*** Enter new value  
0 = disabled  
1 = enabled

**# \* \*** Exit to Main Menu.  
**\* \*** Next item.

FLO: "Float Fail Alarm is....."

You: **X \* \*** Enter new value  
0 = disabled  
1 = enabled

**# \* \*** Exit to Main Menu.  
**\* \*** Next item.

FLO: "Tank Setpoint Low Level is....."

You: **X \* \*** Enter new value  
0 to 9999, decimal is same a previous. If unit speaks 12.34 feet, you enter 567 to change the value to 5.67 feet.  
Setpoint 1: low level alarm  
Setpoint 2: high level alarm  
Setpoint 3: lag level alarm (or all off if set to fill)  
Setpoint 4: lead level alarm  
Setpoint 5: all off alarm (or lag if set to fill)

**# \* \*** Exit to Main Menu.  
**\* \*** Exit to Main Menu.

## 1 2 \* \* Pump Control

FLO: "Pump Control"

FLO: "HOA Switch One Code is....."

You: (X) (\*) (\*) Enter new value  
1 to 7 digits

(#) (#) (\*) (\*) Erase Code

(#) (\*) (\*) Exit to Main Menu.

(\*) (\*) Next item.

FLO: "HOA Switch Two Code is....."

You: (X) (\*) (\*) Enter new value  
1 to 7 digits

(#) (#) (\*) (\*) Erase Code

(#) (\*) (\*) Exit to Main Menu.

(\*) (\*) Next item.

FLO: "Life Runtime One Reset Code is....."

You: (X) (\*) (\*) Enter new value  
1 to 7 digits

(#) (#) (\*) (\*) Erase Code

(#) (\*) (\*) Exit to Main Menu.

(\*) (\*) Next item.

FLO: "Life Runtime Two Reset Code is....."

You: (X) (\*) (\*) Enter new value  
1 to 7 digits

(#) (#) (\*) (\*) Erase Code

(#) (\*) (\*) Exit to Main Menu.

(\*) (\*) Exit to Main Menu.

## 1 3 \* \* Pump Configuration

FLO: "Program Pump Configuration....."

FLO: "Interval Alarm is....."

You:    Enter new value  
 1 to 9999 minutes  
   Exit to Main Menu.  
  Next item.

FLO: "Interval Alarm is....."

You:    Enter new value  
 0 = disabled  
 1 = enabled  
   Exit to Main Menu.  
  Next item.

FLO: "Run Input is....."

You:    Enter new value  
 0 = disabled  
 1 = enabled  
   Exit to Main Menu.  
  Next item.

FLO: "Pump Fail Alarm is....."

You:    Enter new value  
 0 = disabled  
 1 = enabled  
   Exit to Main Menu.  
  Next item.

FLO: "Pump Overload is....."

You:    Enter new value  
 0 = disabled  
 1 = enabled  
 2 = latched  
   Exit to Main Menu.  
  Next item.

FLO: "Pump Overload is Setpoint High is ....."

You:    Enter new value  
 0-9999, decimal point same as previous, if unit  
 speaks "23.4°", you enter 5000 to change the value  
 to 500°.  
   Exit to Main Menu.  
  Exit to Main Menu.

**\* \* \* Query Version**

FLO: "Version Number . . ."

FLO: "Serial Number is . . ."

You: **# \* \*** Exit to Main Menu

You: **\* \*** Next

FLO: "Hardware version is . . ."

You: **# \* \*** Exit to Main Menu

You: **\* \*** Next

FLO: "Firmware version is . . ."

You: **# \* \*** Exit to Main Menu

You: **\* \*** Next

FLO: "Options are . . ."

You: **# \* \*** Exit to Main Menu

You: **\* \*** Exit to Main Menu

---

## 6. TESTING THE INSTALLATION

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It is advisable to test the strength of the cellular network signal as well as the operation of the directories when installing the FLO. If the signal strength is low, additional measures may be required to ensure reliable operation.

### Checking the Received Signal Strength (RSSI)

The FLO has been outfitted with LED indicators on the top of the unit. The Phone LED and Signal LEDs are used to determine the operation of the phone and signal strength of the connection.

<u>STATE</u>	<u>PHONE LED</u>	<u>SIGNAL LEDs</u>
Dead Phone	Solid Red	1 Rolling Red
No Service	Solid Red	<i>(see RSSI = 0)</i>
RSSI = 0	<i>(see No Service)</i>	4 Flashing Red
Invalid MIN and no service	Flashing Red	4 Flashing Red
Invalid MIN and service	Flashing Green	1 to 4 Solid Green
Invalid MIN and roaming	Flashing Yellow	1 to 4 Solid Green
Roaming	Solid Yellow	1 to 4 Solid Green
Everything Good	Solid Green	1 to 4 Solid Green
Starting A Call	Flashing Red/Green	1 to 4 Solid Green
Ringing	Flashing Red/Green	1 to 4 Solid Green
Call in progress	Flashing Red/Green	1 to 4 Solid Green

### Verifying the Telephone Numbers

All of the telephone numbers that are entered into a directory should be carefully checked to guarantee that they are valid numbers and that local (or long distance dialing) is appropriate. After the FLO has been programmed, a test should be performed to confirm that these numbers are called correctly.

## 7. OPERATIONS

This chapter gives a detailed description of exactly how the FLO will operate after the start-up programming has been completed. Parameters which may be altered are pointed out, with reference to the appropriate Program Code section.

### Tank Level Monitoring

The tank is monitored using up to 5 float switches or an analog level transducer.

#### Float Switches

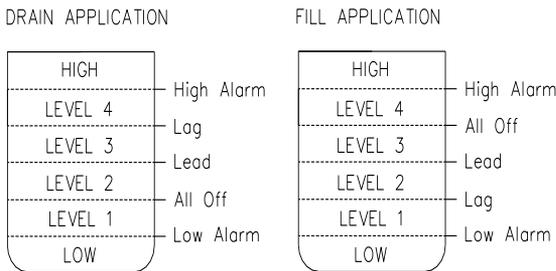
Three float switches (All Off, Lead and Lag) can be used for a dual pump configuration resulting in four distinct tank levels: Level 1 - 4. Optional float switches (High Alarm and Low Alarm) add two additional levels, (High and Low) that can be monitored to generate an alarm condition and serve as a backup in the event one of the other levels is missed (usually the result of a float failure). Fig 3 shows the configuration using all 5 float switches for both a drain and fill application.

For single pump applications the Lag switch is not connected and is considered to follow the Lead switch in the determination of the tank level. Tank levels 3 and 4 are therefore combined into level 4 for a single pump drain application and levels 1 and 2 are combined into level 1 for a fill application.

#### Analog Level Transducer

An analog transducer with a 4-20mA or voltage output can also be used to monitor the tank level. The set-points for the pump control and alarms are software configurable as a percentage of the full tank level.

High and low alarm floats can be combined with an analog transducer for added redundancy.



**Figure 3 Float Switches**

## Float Switch Failures

If the float switch inputs present an inconsistency, the FLO assumes the failed switches state and generates an alarm condition. The Low and High alarm float switches are used as backups for Level 1 and Level 4 in the event the float switch for those levels fails.

The tank level is then reconsidered with the failure taken into account. When there are two or more possible causes for the inconsistency, the FLO assumes a single switch failure in the worse case position. For example, in a drain application if the Lag switch indicates it is above the surface but the High Alarm switch indicates it is below the surface either of the two switches could have failed. The FLO assumes the worst case where the Lag switch is at fault and will set the tank level to “High”. A float failure alarm (as well as a High Level alarm) is then generated.

## Pump Operation

The pumps can be configured to either fill the tank or drain the tank. The action performed at each of the tank levels depends on this configuration, as shown in the following table.

Tank Level	Drain Application	Fill Application
High	Backup Lag Pump On and High Alarm	Backup All Pumps Off and High Alarm
3	Lag Pump On	All Pumps Off
2	Lead Pump On	Lead Pump On
1	All Pumps Off	Lag Pump On
Low	Backup All Pumps Off and Low Alarm	Backup Lag Pump On and Low Alarm

For discussion, the terminology for a tank draining application is used. When the fluid level in the tank is below the All Pumps Off level, the device interprets this as a safe level and turns all the pumps off. If the fluid level then rises above this level, nothing happens until it reaches the Lead Pump On level. At this point, the lead pump is determined and started. If the fluid level continues to rise and reaches the Lag Pump On level, the second pump is started. Any pumps that are running will only be shut off once the level drops below the All Pumps Off level.

For fixed lead pump operation, if one of the pumps has failed or its HOA switch is moved out of the auto position it will be taken offline. The remaining pump will continue to operate when its corresponding tank level is reached.

In alternate mode, the remaining pump will immediately be reassigned as the lead pump.

## Startup

A pump is started when either, the HOA switch is set to the “ON” position or, when set for auto mode and the tank level demands it. When a pump is to be started the FLO checks that the pump is online and that the time intervals described above have been satisfied. If so the control relay turns on and if feedback is enabled the associated Run Status Input is monitored to verify the pump has started. If the pump has not started within 5 seconds (configurable) the output is released and the start procedure retried up to three times. If the pump still has not started, a Pump Fail Alarm condition will be generated and the pump will be taken offline. For manual operation, a Pump Fail Alarm condition will be generated and the pump will be taken offline after the first startup failure. No retries will be attempted.

## Shutdown

A running pump can be shutdown for several reasons.

- The tank reaches the ALL PUMPS OFF level.
- The pump is switched to the manual off mode either from the HOA switch or remotely using the pump off DTMF control code.
- The run status output from the pump indicates it has stopped running.
- The associated Pump Overload Alarm input is activated.
- The Max runtime timer has expired.

When a pump is to be shutdown the FLO checks that the minimum run time has been satisfied. . If so the control relay turns off and if feedback is enabled the associated Run Status Input is monitored to verify the pump has stopped. The FLO will wait the same interval for shutdown that has been configured for startup (Default is 5 seconds) before tripping a pump fail alarm.

## Lead Pump Selection

The FLO can be configured for either Fixed or Alternate Lead pump selection. For Fixed Lead Pump Selection either Pump 1 or Pump 2 can be assigned to always be the lead pump.

When configured to alternate between Pump 1 and Pump 2 the FLO will evenly distribute the wear on each pump by alternating the pump that is started first during the next cycle.

## Pump Timers

If a pump has been running continuously for longer than the programmed Maximum Run Interval, the pump will be shut down and a Run Time Alarm will be generated. For a dual pump system that has been configured to alternate the lead pump the FLO can optionally be set to swap the lead pump selection rather than tripping an alarm. This causes the second pump to become the lead pump and it will start and run until its max runtime limit is reached at which time the lead pump will switch back to the first pump.

This provides a method to distribute the total run time between 2 pumps and to limit the duty cycle for the individual pumps.

When a pump is running, three timers keep track of the pump run time.

<b>Run Interval:</b>	The amount of time the pump has been running continuously.
<b>Today Time:</b>	The total amount time it has been running since midnight.
<b>Total Time:</b>	The total amount of time it has been running over its lifetime.

In addition to these, the Start Count counters keep track of the total number of starts for each pump.

These values can be viewed in the software monitoring window and are available in a report or when interrogating the unit.

## HOA Switch Operation

An external Hand-Off-Automatic (HOA) switch is used to set the pump mode of operation. A single switch can be used to control both pumps in a dual pump application or 2 switches can be used to control each pump independently. The wiring to this switch is configured so that if nothing is connected (or the wiring breaks), the associated pump will be in a Manual Off state. The HOA switch can be remotely controlled by entering user defined DTMF codes from any touch tone telephone. The HOA switch is also used to reset a failed pump by setting it to the Off position and then back to the Automatic or On position.

When the HOA switch is in the Automatic position, the decisions regarding the pump operation are controlled by the level of the fluid in the tank.

When in the ON position, the pump is forced on regardless of the fluid level in the tank. In this position, however, the Pump Run, Pump Overload, and Maximum Run Interval are still monitored and will cause the controller to turn the pump off if these are not satisfied.

When in the OFF position, the pump is forced off regardless of the fluid level in the tank.

## Alarm Reporting

When the FLO detects an alarm condition, it dials the first telephone number stored in the directory. When the telephone call is answered, the FLO will announce its Site ID, the list of any alarms present, and prompt the user to “Enter Acknowledge Code”. It will repeat this message a minimum of three times, pausing five seconds after each announcement to wait for an acknowledgement. When the Acknowledge Code is detected, The FLO will announce “Alarms Acknowledged” and then prompt you to “Enter Command Code”.

If the calling number is busy, if there is no answer, or if the FLO does not receive the Acknowledge Code after announcing the alarm, it will terminate the call then call the next number in the directory. If the FLO reaches the end of the directory without being acknowledged, it will wait two minutes (*config. Directory Timer*) then start calling again beginning at the top of the directory.

In addition to making voice calls, the FLO may be programmed to announce the alarms a number of times over radio, a public address system, or send out a text message or an email containing the alarm information.

## Acknowledging an Alarm

When the FLO calls you on the telephone, it may take up to five seconds before it starts speaking. After it announces the alarms, it prompts you to “Enter Acknowledge Code”. You have five seconds to begin entering digits.

If the FLO has been programmed to operate its relays (*config. Output Configuration*), you may send a relay code over the telephone before acknowledging the alarms. The FLO will actuate the relay, speak the associated voice message, then prompt you again to “Enter Acknowledge Code”. After the FLO has detected the Acknowledge Code, it will speak the phrase “Alarms Acknowledged” and return to the “Enter Command Code” level. If no activity occurs for five seconds, it will hang up.

Appending the (#) digit at the end of the Acknowledge code allows you to acknowledge the alarm for sixty minutes only (*config. General Configuration*). After one hour, the FLO will check the alarm inputs again, and if the same alarm is still present, it will begin the reporting cycle as if it were a new alarm.

If the Site ID and “Alert” is heard after attempting to acknowledge the alarms, the unit is reporting that additional alarm conditions exist that have not been announced and the acknowledgement will not occur. If this occurs, enter the Interrogate Code to hear all the current alarm conditions and then enter the Acknowledge Code.

The FLO can also be acknowledged by sending it a text message that contains the acknowledge code. A confirmation text will be returned.

## Event Logging

Any notable changes to the tank levels and pump operating conditions are logged into the Event Logger. When read from the unit using your PC and programming software, you can expect to see time and date stamped entries for the following:

- Alarm conditions coming and going
- Acknowledgements received
- Callouts made
- Incoming calls answered
- System resets
- Control codes received
- Tank level changes where a float level is crossed
- Float failure alarms
- All pump starts and stops

The non-volatile memory will hold about 365000 events. The logging is done on a first in first out basis where the oldest events are overwritten with the newest. The file retrieved from your unit can be saved as a text file for your records.

## Status Reports

The unit can be configured to call or announce its status on a regular schedule from every 6 hours to once per week. These periodic callouts do not require alarms to be present or acknowledged.

When a radio or voice call is made, the unit speaks the Site ID and any alarms that are present. This feature does not expect the user to acknowledge any alarms announced. The user can either hang up or enter the interrogate code or other “control” codes.

When a Text Message call is enabled, a message with the state of the alarms plus other reporting details will be sent. These details can be user defined. Please note that there are character limits to text messaging and too much information will force the message to be broken into smaller

messages. It is advised that the user select only the information that they find the most relevant.

## Interrogating the Unit

When interrogating the unit, the current alarm conditions, as well as, the status of the tank and pump are reported.

The tank status is reported as the level of the tank. If an analog measurement is taken, this level will be presented in engineering units. If float switches are used, the level will be presented as 0 (low) – 5 (high). Float failure, High Level and Low Level Alarms follow the tank level report.

The pump status is reported as the present state (on/off) of the pump followed by the current cycle runtime (in minutes), the runtime since midnight (in minutes), the total runtime since installation (hours) and the number of times the pump has been started since installation.

## Telephoning the FLO

When you call the FLO on the telephone, it will answer and announce its site ID\*, and possibly the phrase “No Alarms”, and then prompt you to “Enter Command Code”. The FLO then waits ten seconds for you to enter one of the following user defined control codes:

- Acknowledge code
- Interrogate code
- Totalizer or Accumulator input reset code
- Intrusion input arm or disarm code
- Shift change code
- Relay on or off code
- Program mode access code

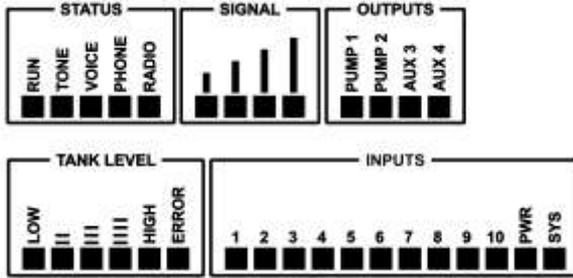
If an Access code has not been programmed, the FLO will automatically go into the programming mode after five seconds, prompting you to “Enter Program Code”. You may then program the FLO from your telephone the same as you would from a local programming phone.

The FLO will hang up whenever it has waited for more than ten seconds without receiving a control code.

*\* refer to page 10 for remote programming security levels*

## Understanding the Indicators

The FLO is equipped with Status Indicators to notify the user of the current operations of the unit and to assist in troubleshooting. The indicators are in the form of LEDs on the top of the unit as shown in Fig 4.



**Figure 4 Status Indicators**

The indicators are grouped into 5 sections.

1. TANK LEVEL (6, 5 for level indicator, 1 for error)

**Low Level**

If the level is higher than the indicator	Green
If the level is lower than the indicator	
And the error is acknowledged	Red
And the error is unacknowledged	Flashing Red

**Levels 2-4**

If the level is higher than the indicator	Green
If the level is lower than the indicator	Off
If the level indicator has failed	Yellow

**High Level**

If the level is lower than the indicator	Green
If the level is higher than the indicator	
And the error is acknowledged	Red
And the error is unacknowledged	Flashing Red

**Error**

If there are no errors	Off
If the error is acknowledged	Red
If the error is unacknowledged	Flashing Red

2. INPUTS (12, ten hardware inputs, one power supply monitor & one system alarm)

If the input is disabled:	Off
---------------------------	-----

If the input is enabled:

Tank & Pump Inputs

Idle, no alarm	Off
Alarm is unacknowledged	Flashing Red
Alarm is acknowledged	Solid Red
Watchdog Reset Activity	Blink Green

Not Configured as an alarm input (*accumulator, totalizer, interval timer or special purpose*)

Idle	Off
Accumulator or Interval timer <i>while active</i>	Solid Green
Totalizer	Blink Green
Special purpose - acknowledge <i>for 500 msec after each operation</i>	Solid Green
Special purpose – shift 1 or 2	
Shift 1	Solid Green
Shift 2	Flashing Green
Special purpose – advance shift	Blink Green

3. STATUS (*5 defined*)

Run

During startup initialization or upgrading	Flashing Red
During program mode (PC or handset)	Solid Red
Operating	
No low power modes selected	Flashing Green
Low power mode in effect	
Normal conditions	Short Green Flash
Error condition	Short Red Flash

Tone

Idle	Off
While a tone is being transmitted	Solid Red
While a tone is being received	Solid Green

Voice

Voice	Off
While speaking	Solid Red
While recording	Solid Green

Phone

*This indicator is used in conjunction with the SIGNAL indicators, see below*

Radio

Idle	Off
While PTT is active	Solid Green
While COS is active (busy)	Solid Red

#### 4. SIGNAL

*Refer to the Signal & Telephone Status table found on Page 30.*

#### 5. OUTPUTS (4, one for each output relay)

##### Pump (Output Pump 1 & Pump 2)

During Startup

Flashing Green

Running

Green

Restarting

Flashing Yellow

Alarm Unacknowledged

Flashing Red

Alarm Acknowledged

Red

Off

Off

##### General (Output Aux 1 & Aux 2)

Off

Off

On

Green

---

**8. SPECIFICATIONS**

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Physical:	10" wide x 5.6" high x 3" deep Steel, powder coated matte black Mounting ears for panel installation
Environmental:	-30°C to + 60°C, 95% humidity, non-condensing
Power:	Plug-in screw terminal block connection Internally fused at 1.85A +9 to +30 VDC, negative ground Optional internal battery backup: 1.4 Ahr 12 volt battery Built-in charger: Charger operates with input voltages between +8 and +30 VDC
Alarm Inputs: (10)	Plug-in screw terminal block connection All inputs will withstand up to +30 VDC Inputs 1 to 6: Analog voltage mode: Input impedance: 210k ohm Range: 0 to +5 or 0 to +30VDC Digital mode: Internal 4.7k ohm pull-up resistor to +5 VDC Operates with ground closure Low state threshold of +2 VDC Inputs 7 to 10: Analog voltage mode: Input impedance: 75k ohm Range: 0 to +5 or 0 to +30VDC Analog current mode: Input impedance: 100 ohm between pins 75k ohm to ground Range: 4 to 20 mA Digital Mode: Internal 4.7k ohm pull-up resistor to +5 VDC Operates with ground closure Low state threshold of +2 VDC
Relay Outputs: (4)	Plug-in screw terminal block connection Contact rating: 2A/30 VDC 2 contact terminals, programmable as normally open or normally closed

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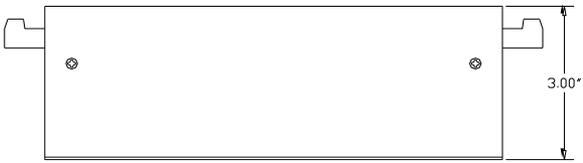
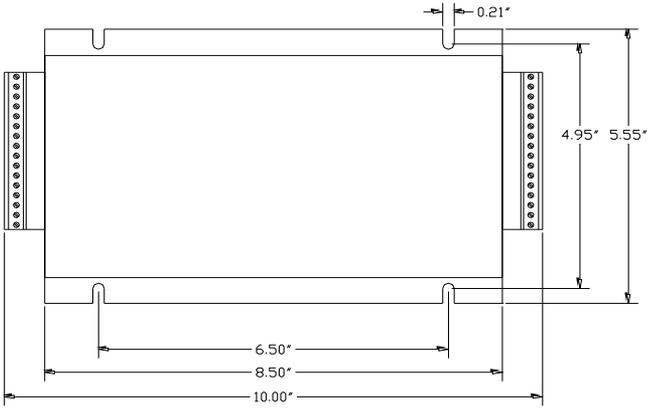
Cellphone:	SMA female connector CDMA cellphone
Radio Port:	Plug-in screw terminal block connection TX audio: 600 ohms, single ended, capacitor coupled Adjustable between 0 dBm and -20 dBm RX audio 600 ohms, single ended, capacitor coupled Adjustable between 0 dBm and -20 dBm
Program Ports:	Telset: RJ11 connector Internal telset bias from the primary power supply Operates with standard TouchTone telephones RS232: DB9 male connector, DTE USB: USB type B connector
Power Switch:	Momentary pushbutton

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**9. TECHNICAL DRAWINGS**

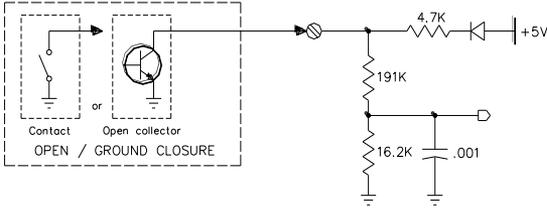
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**Unit Dimensions**

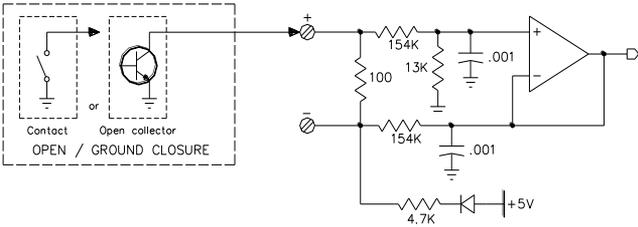


# Wiring Inputs

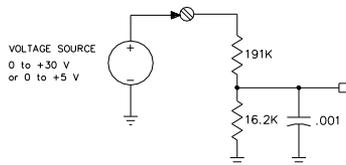
## Digital connection – Inputs 1 through 6



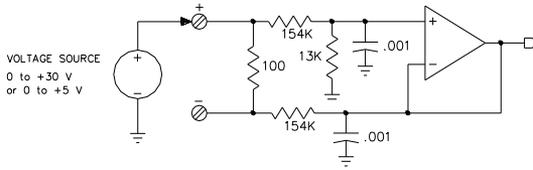
## Digital connection – Inputs 7 through 10



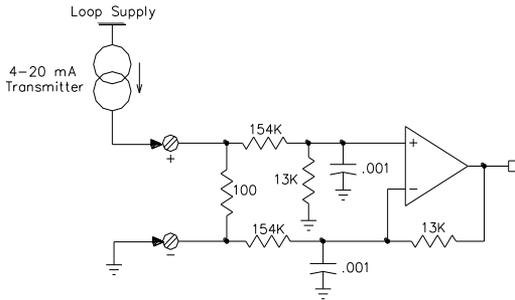
## Analog Connection – DC Voltage – Inputs 1 through 6



### Analog Connection – DC Voltage – Inputs 7 through 10



### Analog Connection – DC Current – Inputs 7 through 10



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## 10. GLOSSARY

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**Access Code** – a string of DTMF digits that act as a security password when calling in to a unit with a security level set to two or three. This string of digits is also required to enter programming mode when calling in to remotely program a unit.

**Accumulator** – an input type that keeps a tally of the amount of time an input is asserted. If the input is de-asserted, the timing stops and resumes when the input is re-asserted.

**Analog Input, 30V** – an input type that monitors a voltage and possibly has a high and low alarm setpoint with an accepted range on the input terminal of 0 to +30 VDC.

**Analog Input, 5V** – an input type that monitors a voltage and possibly has a high and low alarm setpoint with an accepted range on the input terminal of 0 to +5 VDC.

**Carrier Operated Squelch** – an output from a radio that indicates the receiver squelch is open. This signal is used by the ProTalk FLO to determine when the radio system is busy where it should delay making an announcement. a.k.a Carrier Operated Relay (COR)

**Control Code** – a string of DTMF digits that are recognized by the unit to perform an action. Examples of Control Codes include the Acknowledge Code and an Output On or Off Code. Alternatively, key presses used when programming are referred to as Program Codes.

**COS** – see *Carrier Operated Squelch*

**COR** – Carrier Operated Relay - see *Carrier Operated Squelch*

**Current Input** – an input type that monitors the flow of current in a current loop. This input type may have a high and low setpoint and has an input range of 4 to 20 mA DC.

**Dial Control** – a function that, when enabled, delays alarm annunciation until the recipient of the call speaks into the phone. (eg. “Hello”)

**Digital Input** – an input type that, when asserted, generates an alarm condition. This input type may be configured as asserted by grounding the input terminal, opening the input terminal, or providing a voltage to the input terminal that crosses a 2VDC threshold.

**Dipole Antenna** – a simple structure RF antenna. The dipole antenna included with the FLO is intended for indoor use only and has limited range.

**Directory** – a list of callout instructions that are executed sequentially when an alarm occurs. Each directory line may specify a telephone number to call, a radio transmission with paging tones, or a mobile number to send a text message to.

**DTMF** – Dual Tone Multiple Frequency; a series of audible tones used for remote command and control of equipment

**Hysteresis** – a dead zone around a low and high alarm setpoint that requires the input to change sufficiently after creating an alarm before the level is recognized as being normal again. The hysteresis value should be set larger than the natural short term variations found on an analog input.

**Interval Input** – an input type that measures the amount of time the input has been asserted. Each time the input is asserted, the count is reset to zero. When the input is de-asserted, the measured value is maintained until the next measurement begins.

**Intrusion Input** – an input type that provides a time delay and the ability to enable (arm) and disable (disarm) an alarm using a DTMF code. An alarm condition detected on this input remains until the disarm code is received.

**Program Code** – a DTMF digit followed by two \* digits that specify the programming parameter to be changed.

**PTT** – *see Push To Talk*

**Pulse Width** – *see Interval Input*

**Push To Talk** – an output from the FLO that provides a ground closure when a radio transmission is required and an open circuit when idle. a.k.a. Push To Transmit

**Relay** – an output that provides a normally open (Form A) or normally closed (Form B) set of isolated contacts that have the capacity to be used to turn on lights or sirens or control other equipment.

**Shift** – a time when an alternate directory (or set of directories) is used.

**SIM** – subscriber identity module

**Totalizer** – an input type that counts the number of transitions of an input between asserted and de-asserted states.

**Watchdog** – an input type that remains in the idle state as long as the signal on the input terminal is transitioning between asserted and de-asserted states. If the input stops changing for a specified amount of time, an alarm is generated.

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## 11. SIM CARD REPLACEMENT

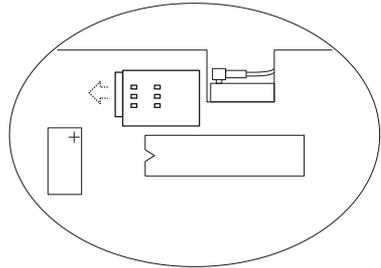
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The Cv3 utilizes an HSPA cellphone module that requires a SIM card to operate on a cellular network. The SIM cardholder is located inside the Cv3 therefore it is necessary to remove the top from the case in order to gain access to the cardholder.

**It is important to observe proper electrostatic grounding precautions during this procedure.**

Installation Steps:

- Remove power from the FLO.
- Using a small Phillips screwdriver, remove the four black aluminum screws around the base of the FLO metal box.
- The top of the case containing all the electronics can now be removed from the base of the FLO.
- The SIM card socket can be seen near the center of the board by the cutout provided for the antenna cable. Pressing it in until a click is felt and then releasing it ejects the SIM card. The card will then pop out or be free to pull out.
- The new card is installed with the gold contacts facing down toward the board and the wireless carrier's logo facing up. Press the card in until you feel a click where it engages the locking mechanism. At this point, almost all of the card will be inside the holder.
- Replace the top of the case onto the base and secure with the four screws.
- The FLO should be ready for use.



Testing:

- Apply power to the FLO and compare the PHONE and SIGNAL indicators with the chart on Page 30.

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## **12. PRODUCT SUPPORT**

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Thank you for choosing the ProTalk FLO from Barnett Engineering Ltd.

### **Technical Support**

Technical Support for your ProTalk FLO is available as follows:

#### **Network & Billing Support**

If you have any questions related to network connectivity or your wireless account, please contact your local service representative.

#### **Product Support**

For questions related to activation, performance, service, repair or other technical or product support concerns, please contact Barnett Engineering Ltd. At 1-800-268-2646 or email [support@barnett-engg.com](mailto:support@barnett-engg.com)

### **Product Repairs**

For all your repair needs, please contact Barnett Engineering Ltd.

Barnett Engineering Ltd. commits to a 'Repair Turnaround Time' of thirty (30) business days on all units under warranty. Repair Turnaround Time is defined as the time elapsed from the day the defective product arrives at Barnett Engineering Ltd. facility located in Calgary, Alberta to the day the repaired product is returned and received by you.

For non-warranty units, please call Barnett Engineering Ltd. and ask for a repair estimate.

An RMA form is available in the Support section of our website. Please complete this prior to shipping your unit.

### **Shipping**

Customers are responsible for all shipping costs, to and from Barnett Engineering Ltd.

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**13. WARRANTY STATEMENT**

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Barnett Engineering Ltd. warrants that all equipment supplied shall be free from defects in material or workmanship at the time of delivery. Such warranty shall extend from the time of delivery for a period of one year. Buyer must provide written notice to Barnett Engineering Ltd. within this prescribed warranty period of any defect. If the defect is not the result of improper usage, service, maintenance, or installation and equipment has not been otherwise damaged or modified after delivery, Barnett Engineering Ltd. shall either replace or repair the defective part or parts of equipment or replace the equipment or refund the purchase price at Barnett Engineering Ltd. 's option after return of such equipment by buyer to Barnett Engineering Ltd.

Shipment to Barnett Engineering Ltd.'s facility shall be borne on account of buyer.

(1) Consequential Damages: Barnett Engineering Ltd. shall not be liable for any incidental or consequential damages incurred as a result of any defect in any equipment sold hereunder and Barnett Engineering Ltd. 's liability is specifically limited to its obligation described herein to repair or replace a defective part or parts covered by this warranty.

(2) Exclusive Warranty: The warranty set forth herein is the only warranty, oral or written, made by Barnett Engineering Ltd. and is in lieu of and replaces all other warranties, expressed or implied, including the warranty of merchantability and the warranty of fitness for particular purpose.

**WARNING: This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instruction manual, it may cause interference to radio communications.**

**Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, must take whatever measures may be required to correct the interference.**