



Operating Manual



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BASIC COMPONENTS

- 1) Battery Pack or 12VDC adapter
- 2) Tank Level Display
- 3) Fill Button
- 4) Differential Pressure Sensor

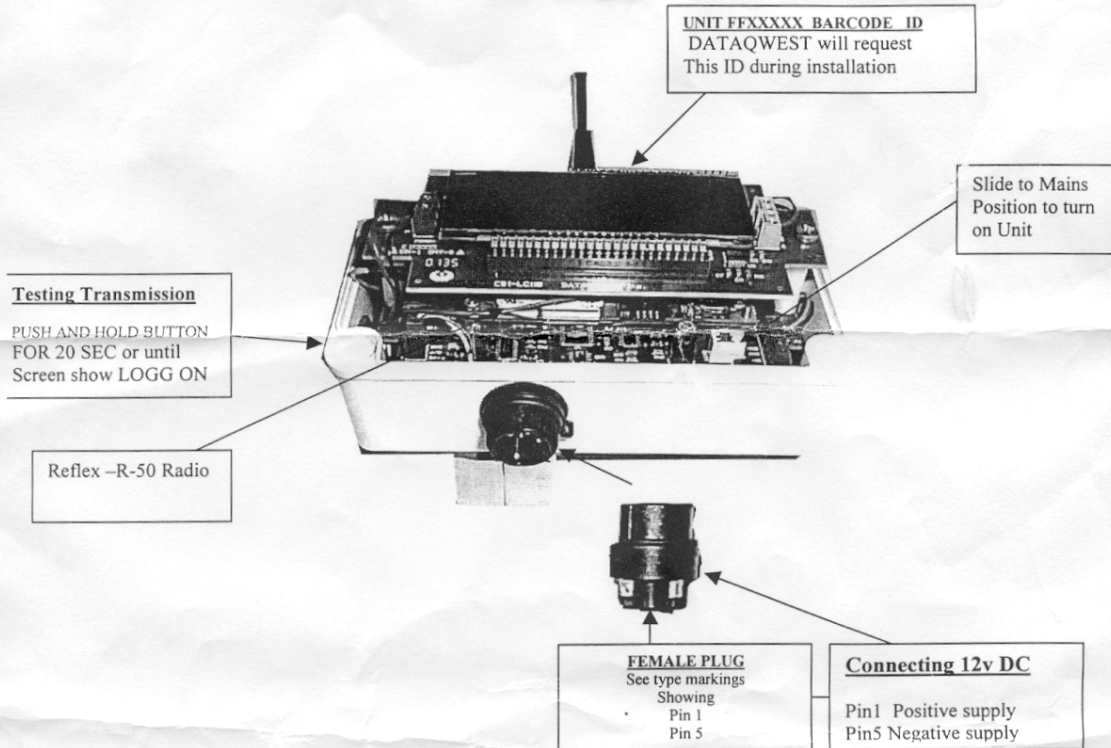
Unit Description

The *Cyl-Tel2* wireless Remote Monitoring Unit (RMU) is specifically designed to be a bolt-on contents gauge for the Perma-Cyl[®] series MicroBulk tanks. It provides local and remote indication of tank level for the user/operator and logistics operations. The unit is completely self-contained; using the battery pack or 12vdc AC adapter and FCC licensed wireless communication. Data can be posted to an existing Logistics system or a DataQwest hosted Internet site.

The enclosure is rated Nema 4x and mounted to the brass differential pressure sensor. A wall mount battery pack or 12VDC adapter are used to power the unit. Piping components are 1/4" Brass construction, cleaned for oxygen service, and are ready to accept new or existing sensing lines. The RMU is mated with an industry proven, reliable, and accurate Cyl-Tel2 Differential Pressure sensor.

All user functionality is accessed via a simple single push button operation.

CYL-TEL UNIT WITH REFLEX 50 RADIO



PLEASE CALL **DATAQWEST** FOR RADIO COVERAGE AREA
908-464-2646 EXT 12 PLEASE STATE THE RADIO TYPE

Cyl-Tel2 Quick Start Instructions

User Interface

The Cyl-Tel2 wireless RMU's primary function is to log periodic tank level information and report it off site to a Web Page or a Logistics System. It is designed to operate without user intervention. Some features are accessible via the 'FILL' button.

Fill Button

The unit Logs data on a pre programmed periodic basis, typically once per hour. The RMU 'wakes up' on this interval and updates the display.

Current Reading –To obtain the current Reading in the tank, momentarily press and hold the Fill button. After approximately 2 Seconds, the display will show **FILL**. The Display will blink with the current tank level for up to 15 minutes.

Fill Mode- Prior to filling the vessel, an operator must engage fill mode to make the display 'live.' The operator will Press and hold the Fill button for approximately 2 Seconds. The display will show **FILL**, and blink with the current reading for 1 Hour. If the unit does not detect a ¼ % Span increase after 15 minutes, fill mode will deactivate and the unit will go back into its normal data logging routine.

Test Transmission/ Log On – Upon installation, the operator will 'force' the unit to initiate a call through the network to 1) Verify communication and 2) Configure the RMU to the Specific tank it will monitor.

To perform this action the operator must press and hold the FILL button for approximately 20 seconds. The unit will display **FILL**, then after 20 seconds change to **LOG-ON**. The operator will then release the Fill button and the display will show **CALL** while the unit initiates communication to the network. It will try to contact the network for up to 8 minutes.

*If the unit is unable to communicate to the network after several minutes; the display will change from **CALL** to **ERROR** for 20 seconds then revert back to the tank level.*

INSTALLATION PROCESS

Off Site Considerations

Upon receipt the unit is operational and ready to be installed on a tank. If you are unable to install the unit within a week please call Chart for instructions to disable the unit. Delaying installation can have an adverse affect on battery life and can possibly void the warrantee.

Specific RMU for Specific Tank- To ensure that a given unit reports data for the correct tank, and to make sure that the RMU will operate properly, any questions as to where a particular device is intended, need to be referred to Chart. Different geographical areas can require different modems; and frequently units are pre-programmed for a specific tank to facilitate faster installation.

Sensor Span - Verify that the span of the Sensor is appropriate for the tank. The units typically come with 0-160" Sensor span. ***IMPORTANT: The sensor cannot tolerate more than 30 psig differential on one side of the gauge or permanent damage will occur.***

Site Alarms – If the end user has site alarms, typical of hospitals and heat-treating applications, you can order a relay kit to provide this functionality.

Equalization/Bypass Valve- A four-way valve is available from Chart to allow isolation of the Cyl-Tel2 gauge for maintenance or zeroing the gauge. This valve is custom designed to prevent the overpressurization of the sensor and must be used if isolation is necessary.

On Site Considerations

Dedicated Lines- If the sensing lines are tied into Pressure building circuits or auxiliary devices, the reported level may fluctuate. Please note in the site form any variation in the tubing lines other than dedicated gas and liquid lines.

Hazardous Electrical area – If the tank is in a hazardous area you must locate the unit outside the hazardous area or call DataQwest for options.

Installing The Wireless RMU

Prior the Removing the existing Gauge, Please Begin to Fill out the Site form that arrived with the unit. ***It is important to note the Tank Level and Pressure prior to removal of the gauge.***

Isolate and Remove the Contents Gauge

- Note current tank level and pressure on the Site form
- Open the Equalization valve, then close both block valves to the gauge
- Carefully bleed the lines to atmosphere and completely disconnect the sensing lines

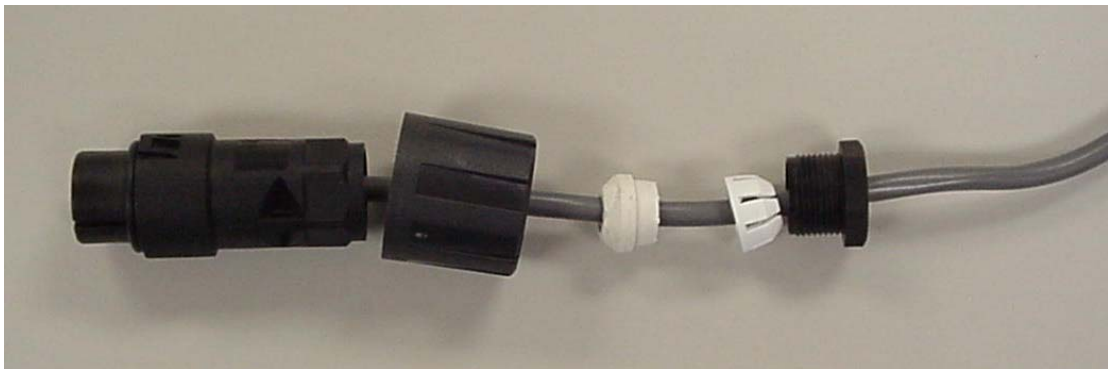
- Remove the 4 Screws securing the gauge with a Flat head Screwdriver
- Remove the Contents gauge, Remove the Male adaptors from the underside of the gauge, re-tape and re-install on the new unit to go from Female NPT to Tube

Mount the new Unit

- Install your pressure gauge on the new unit.
- Mount the new RMU to the tank using the supplied hardware.
- Re-Connect the sensing lines. The Gas leg is on the right. Open the block valves to pressurize the system; check for leaks with a suitable leak detector.
- Press the fill button till **FILL** appears to obtain the current reading
 - The current level should be displayed
 - If **ERROR** appears, the sensing lines are most likely reversed.

Installing the Battery Pack

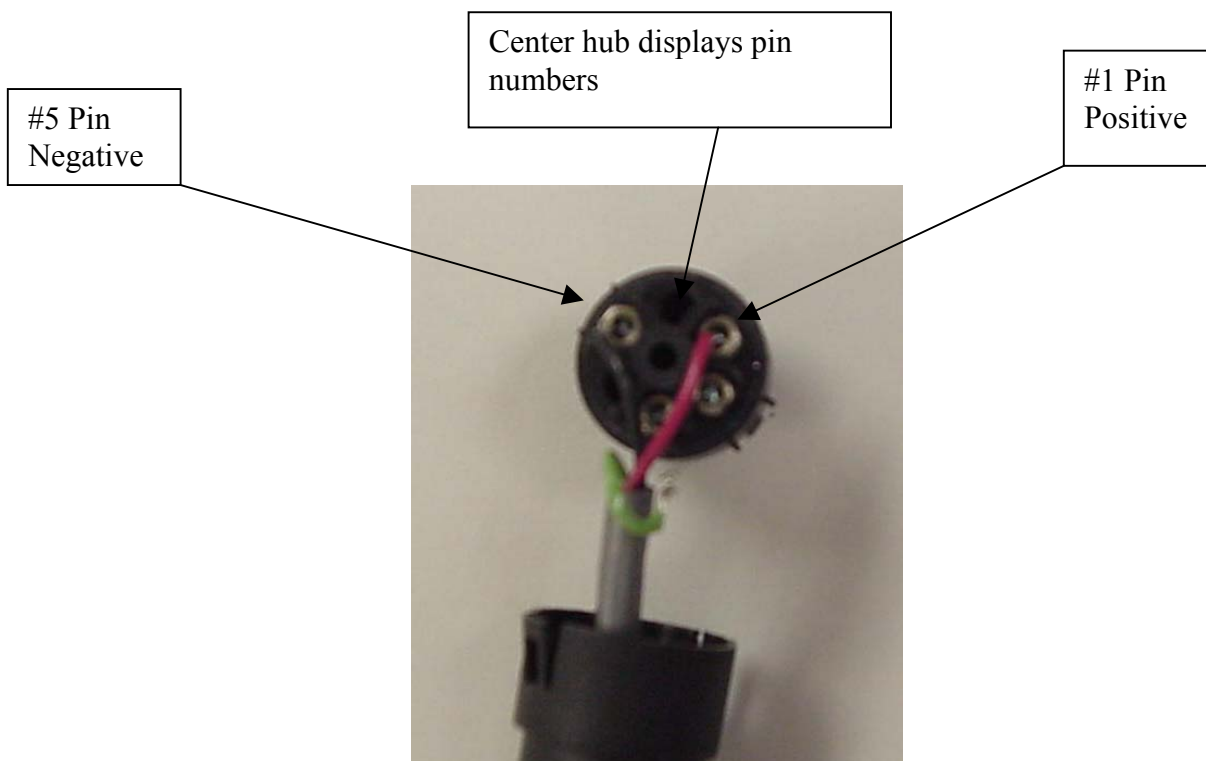
- Wall-mount the battery pack by removing the front face and using the four corner holes.
- Remove the black electronic plugs on the Cyl-Tel2 and the battery pack.
- Disassemble each plug to expose the screw terminals.
- Determine the length
- Using a two-conductor wire, about 22 gauge (P/N 11080860 is a four-conductor and will work fine), connect the same colored wire to pins #1 (positive) on each plug and pins #5 (negative) on each plug.
- Reassemble plugs and connect power up the system.

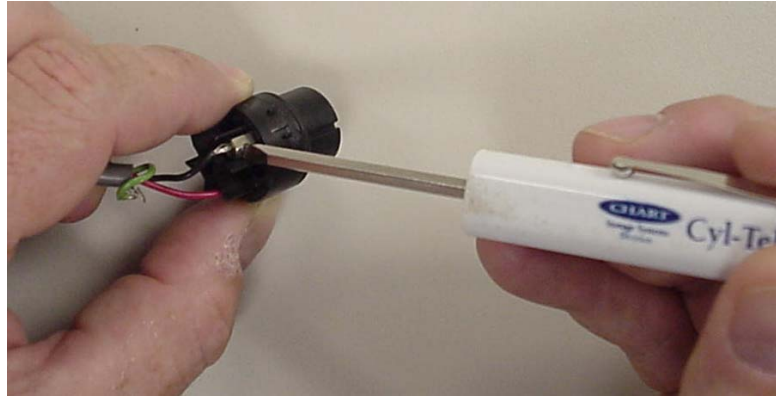


Power connector exploded view with customer supplied 22 – 24 gauge wire



Socket removal – open two tabs





Installing the 12 Volt AC Adapter

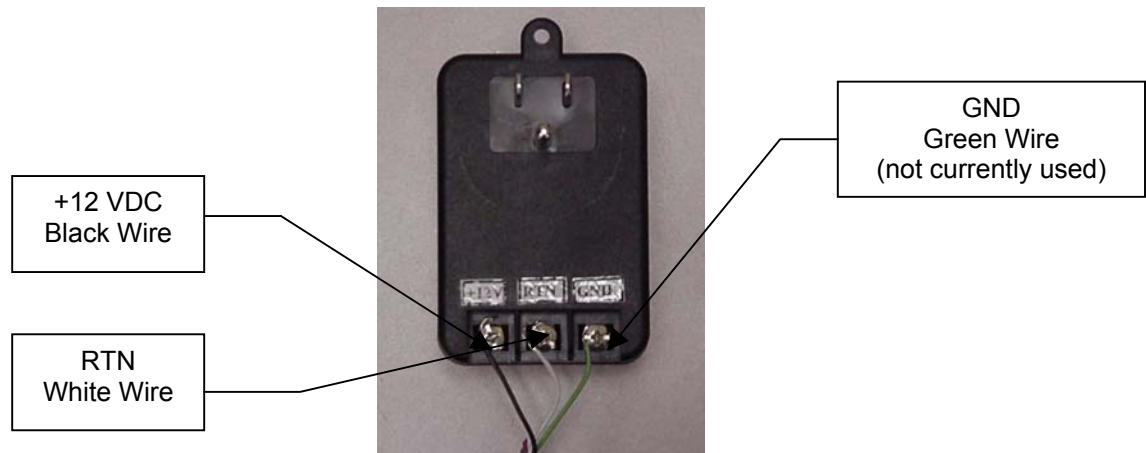
- Run a two-conductor wire from the Cyl-Tel2 to the AC adapter
- Strip the ends and install the black plug on the Cyl-Tel2 side per the above instructions
- Attach the other end to the AC adapter (11061378) as shown below.
- Power up the system

Wire the Power Pack to the CYL-TEL2 Gauge.

Connect the positive (+) 12VDC power wire (Black) to the “+12V” output of the power pack. See Error! Reference source not found.Error! Reference source not found..

Connect the negative (-) 12VDC (RTN) wire (White) to the “RTN” output of the power pack. See Error! Reference source not found.Error! Reference source not found..

The GND output of the power pack is not currently used.



Bring the system On-line

- Call DataQwest at (908) 464-2646x12, you will need to supply the RMU device ID, typically it is like FFDxxxxx
- You will be instructed to, Press and Hold the FILL button for approximately 20 seconds, you will see **LOG ON**, then **CALL** on the display.
- The unit will log on to the network; it could take up to 8 minutes.
- Keep an Eye on the unit, if **ERROR** is displayed, the unit failed to connect to the network. DataQwest will verify coverage and walk you through steps to rectify the situation.
- Upon Successful transmission to unit will receive its alarm points and begin to log data. It is now on line.

Fill out the Paperwork

- If not previously completed, please fill out the site form and fax to Cyl-Tel2 coordinator at Chart D&S New Prague, MN, 952-758-8293 for processing.
- ***The unit cannot be turned on to provide data until we receive this form.***

UNIT OPERATION / PROGRAMMABLE FEATURES

The *Cyl-Tel2* Wireless RMU has standard parameters and several programmable features. Many features have cost implications or require different hardware, which may need to be addressed prior to enabling them.

The unit logs a data point once per hour and has two Scheduled transmissions per day, typically 3AM and 3PM EST. In addition, the unit will initiate a call when it senses a level below 2 pre-determined alarm set points, commonly referred to as Re-Order and Critical points. The Unit will also initiate a call whenever the vessel is filled, as long as the Driver/Operator engaged Fill Mode.

Programmable features include, Data Transmission Frequency, Data Sampling rate, Additional alarm set points, Length of time the Unit remains in Fill Mode, Sensor Voltage supplied, and sensor settling time

Data Logging

- As frequently as every 15 minutes to once every 24 hours.

Data Reporting

- As frequently as every 15 minutes to once every 24 Hours

Sensor Settings

- Voltage Supplied to the Sensor can range from 12 to 23 volts
- The sensor can be powered for .25 to 60 seconds to allow it to stabilize.
- If the unit detects values below 3.5 or over 22 mA the Display will read **ERROR**

Fill Mode

- Duration of Fill Mode can be from 15 minutes to 8 hours
- Update rate – In fill mode the display can be updated every 2 to 60 Seconds
- Fill alarms can be generated if a 2 % level increase is detected in Fill mode

Alarming

- The unit can accommodate up to 10 level alarms.
- Once engaged, an alarm is re-armed after the level increases ½% span over the set point.

Over the Air Programming

Any of the programmable features can be directly input to the device by DataQwest or via an over the air program or OTAP.

The message will remain in queue until the unit calls in a scheduled reading, alarm, fill event or if a test transmission is initiated via the fill button.

UNIT DIAGNOSTICS

Display

The RMU indicates a problem when the display reads **ERROR**. This occurs in two situations.

- **ERROR** Will be displayed for 20 Seconds after an Unsuccessful test transmission initiated via the Fill Button
- **ERROR** Is shown when the Unit detects a sensor value out of the range of 3.5 to 22 mA or an open circuit.

Diagnostic LED's

Inside the unit there are 3 LEDs, which give diagnostic information pertaining to radio status. They are visible through the transparent cover of the unit. *Opening the unit may void the warrantee.* Only open the unit under direction of DataQwest.

When a call is initiated, whether a scheduled reading, alarm, fill event, or a test transmission via the fill button, a sequence of LEDs reveals what operation is being performed or cause of failure.

Power Modem Up

Yellow – Lights up indicating the modem is powered up and remains on

Begin Transmission

Green – Lights up and remains on while the RMU is communicating with the modem

Several Minutes can elapse while the unit attempts to communicate with the network

Successful Transmission

Green – Remains ON

Red - Flash Rapidly

Failed Transmission

Red – Come ON

Green- Flash, the number of flashes will indicate the reason for failure

- | | |
|------------|---|
| 1 Flash- | No messages in Queue to be received by RMU |
| 2 Flashes- | Modem could not log on to network |
| 3 Flashes- | Modem did not respond |
| 4 Flashes- | RMU did not receive Confirmation from tower that outgoing message was delivered |

After a successful transmission, the unit will check for any incoming messages;

New Message received

Green- Come ON

Red – Flash Rapidly

The unit will send a confirmation response, and the transmit sequence above will be repeated.

No Message to Receive

Red- Come on

Green- Flash Once

Reception Failed

Red- Come on

Green- Flash slowly according to above list

At the end of the transmit/receive cycle the Modem will be powered down which is indicated by the extinguishing of the *Yellow* LED.

TROUBLE SHOOTING

Display reads ERROR continuously

The Display will read **ERROR** whenever the sensor loop detects values below 3.5 mA, Over 22 mA or there is an OPEN circuit.

- *Inspect wire terminations*
 - Open the Left side cover of the sensor housing. Make sure the wiring is intact. Press FILL to see if display goes to level.
 - Open unit cover using 7/16" Nut Driver. Check that Sensor wiring is securely fitted to +VE for Sensor Supply and Return for 4-20mA signal return.
- *Check Sensor Loop Supply Voltage*
 - With a Multi-meter on DC Volts Check that the sensor is getting voltage from the unit. Probe +VE and GROUND on the right terminal block. Press FILL to activate the sensor circuit. The meter should jump to approximately 16 volts intermittently. (Every 10 seconds for 2 seconds)
- *Check Sensor Zero*
 - Close the block valves on the sensing lines. Carefully bleed off the pressure. Sensor should go to Zero.

Display is blank

- Open the cover and inspect for damage; cracks, etc. Carefully detach and re-attach the connections between the display and the board.

Level reported is erratic

- Check that the sensor wires are intact as described above
- Inspect the sensing lines. If they are not dedicated, i.e. tied into the Pressure Build Circuit or any auxiliary components this is the probable cause.
- Check the sensing lines for any sharp bends or pinched areas that could restrict flow.
- Ensure that any block valves in the sensing circuit to the sensor are open and equalization/bypass valves are closed.
- Check that no fitting or valve packing is leaking.
- Disconnect the sensing lines from the unit and blow them out. Be sure that they flow unobstructed. *Exercise caution while performing this action as cryogenic liquid can be expelled from the vessel.*
- Engage the fill button and look for fluctuations. Does this correspond with any surges of product usage?
- Install an analog contents gauge, check for level fluctuations.

Level reported is Inaccurate

- Check all the parameters for an erratic reading
- Bleed Pressure and verify Unit reads Zero
- Verify that sensor span with DataQwest to make sure the unit has the proper configuration
- If compared with an existing contents gauge verify that it is calibrated properly

- Apply pressure to the left side/High side/Liquid Leg of the Sensor with a hand pump. Enter fill mode and apply pressure. Display should read 27.7 inches H2O for each PSIG. Make sure you follow your company's guidelines for working on medical or any other specialized systems.

Battery Voltage continually drops/Low reported voltage

- Check Battery Voltage

Unit will not Log On to the Network/ ERROR displayed after call attempt

- Remove the device from the tank and other obstructions, try again. If successful try another location closer to the tank.
- Call DataQwest to verify that the location is in coverage and that you have the correct unit for the area
- Observe the LED sequence as described in the previous section to clarify cause of failure
- Check the antenna connection inside the RMU for tightness
- Check that the connector from the radio to the main board is securely fastened, top right corner of the unit.



Customer Information Form for Telemetry Unit Installation
Please complete one of these forms for each telemetry unit ordered.

Use the "Tab" key to advance fields.

Use spacebar or mouse to mark desired check-boxes where needed.



TANK-TEL™² ☐ TANK-TEL™² ☐ CYL-TEL™² ☐ Indoor ☐

1. Customer Billing Information (Typically Distributor):

Customer Name: _____ Contact: _____ Date: _____
Address: _____ City: _____ State: ____ Zip: _____ Phone: _____
Purchase Order Numbers: Gauge/Hardware: _____ Monthly Data & Web Service (remains open): _____

2. Tank Site Information (End-User):

Site Name: _____ Contact (if any): _____
Address: _____ City: _____ State: ____ Zip: _____ Phone: _____

Transmission Coverage Checked (To be filled out by DataQwest): **Yes** ☐ **No** ☐ Web access requested: **Yes** ☐ **No** ☐
Note: If web access is requested by end-user, DataQwest will contact end-user directly and coordinate password protection

3. Tank Information:

Tank Identification at Tank Site: _____

Product: _____

Full Reading: ____ (inches of H₂O)

Reorder Reading: ____ (inches of H₂O)

Low Level Alarm Reading: ____ (inches of H₂O)

Tank Orientation:Vertical ☐ Horizontal ☐ Unit installed on: ...Tank ☐ Instrument Stand ☐

Are Extra Alarms to Customer Required:Yes ☐ No ☐ Original D.P. Gauge: ...Removed ☐ Retained ☐

4. Contact for Web Site: User Name and Password (Distributor)

Company Name: _____ Contact: _____
Address: _____ City: _____ State: ____ Zip: _____ Phone: _____

Previous Customer Identification No. (if applicable): _____

Alarm Method: E-mail Address: _____

Fax Number: _____

Name of Contact: _____

**Complete this form and send to attention Chart Rep.
Either send via fax 1-952-758-8293 or email to Chart Rep*



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