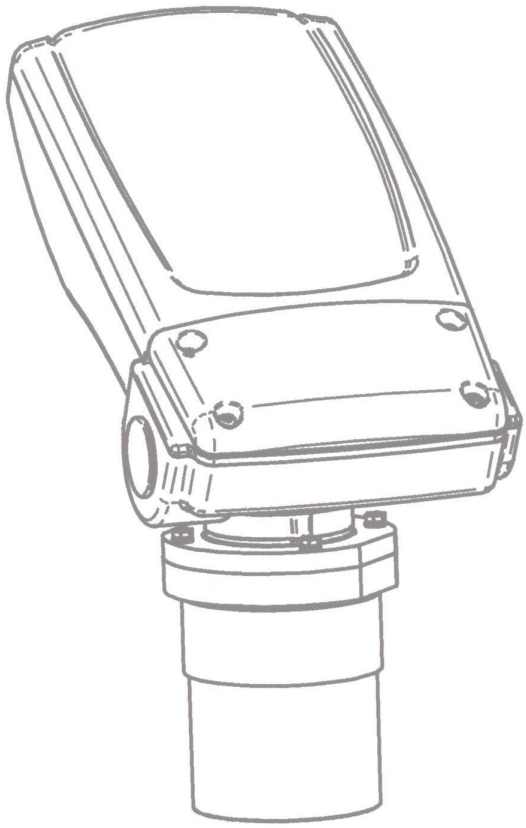
# MicroScan
# User Manual



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| Date | Revision | Software Version | Catalog Number |
|---|---|---|---|
| Feb.2004 | 1.5 | 4.09 English | 6800200 |

# Safety Guidelines

- MicroScan must be installed, connected and operated according to the instructions in this Manual.
- If installed incorrectly or used for applications for which it is not intended, application-related dangers may arise.
- Only qualified personnel are authorized to install and operate MicroScan.
- Do not open the MicroScan unit. If the unit is opened, the warranty is null and void.
- Modifications and repairs to MicroScan are permissible only when the manufacturer expressly approves them.

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# Chapter 1

# Introducing MicroScan

MicroScan is an ultrasonic, non-contact level measurement device of mono-block construction (combing the sensor and electronic components in a single unit). MicroScan provides reliable and precise level measurement results of both liquids and solids.

It can be used for the following measurement tasks:

- Liquid tanks with calm surfaces
- Solids tanks that are dust-free

MicroScan has a range of up to 5 m (16.5 ft) with an accuracy of approx. 0.25% within that range.

MicroScan is available in two configurations:

- MicroScan with no display and no keyboard ("Blind" unit)
- MicroScan with optional display but without keyboard

The following models are available for each configuration:

- MicroScan L for liquids
- MicroScan S for solids

The following diagrams show the front and side views of MicroScan, and its dimensions:

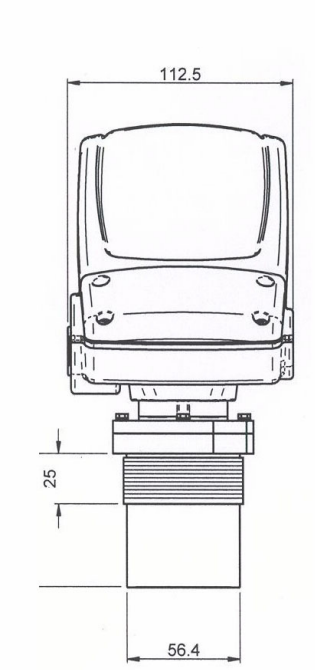



Figure 1: Front View of MicroScan

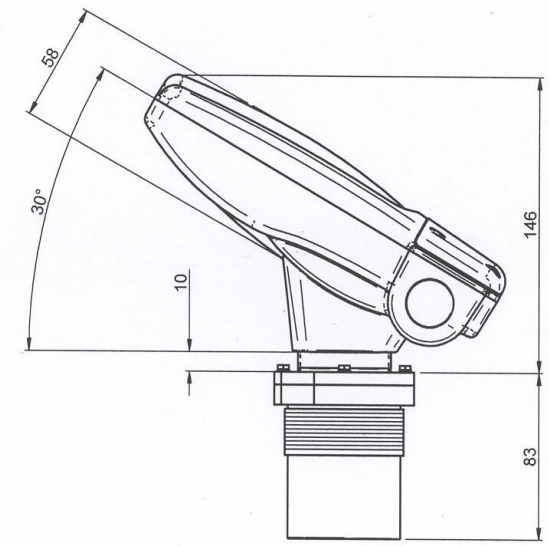



Figure 2: Side View of MicroScan

# MicroScan Specifications

| | |
|---|---|
| **Accuracy** | 0.25%* of measuring range |
| **Resolution** | 1 mm (0.04") |
| **Beam angle** | 5° @ 3db point |
| **Ambient temp' compensation** | Automatic |

* 0.25% or 1.25cm whichever is greater.

## Measuring Ranges

| | |
|---|---|
| **MicroScan L for liquids** | 0.25 m — 5 m<br>0.8 ft — 16.4 ft |
| **MicroScan S for solids** | 0.25 m — 3.5 m<br>0.8 ft — 11.5 ft |

## Mechanical Specifications

| | |
|---|---|
| **Enclosure** | IP 65, mono-block construction.<br>Plastic enclosure: ABS+UV |
| **Wetted parts** | Sensor body: PolyProp. PVDF, optional.<br>Stainless Steel for Liquid model; Coated Aluminum for Solid/Liquid model. |
| **Operating temperature** | -40° C to + 70° C<br>(-40° F to +158° F) |
| **Mounting** | 2" BSP or 2" NPT |

| | |
|---|---|
| **Mechanical fitting** | Conduit connection M20x2.5 or 1/2" NPT |
| **Operating pressure** | Atmospheric |
| **Dimensions** | 22.3 x 11 x 4.5cm (8.7 x 4.3x 1.7in) |
| **Weight** | Approx. 0.75Kg (1.65lb) |

## Electrical Specifications

| | |
|---|---|
| **Optional Display** | LCD, four digits, seven segments |
| **Operation** | Four push buttons |
| **Loop current** | 4 — 20 mA, 750 Ω @ 28 VDC |
| **Supply** | 12 — 28 VDC (CE certified) |
| **Certificates** | CE — EMC |

# MSU Specifications

| | |
|---|---|
| **Display** | LCD (4 digits — 7 segments) |
| **Keyboard** | 4 buttons |
| **Cable** | 0.60m (23.6in) |
| **Housing material** | ABS + UV |
| **Dimensions** | 9.5X11X2.5cm (3.7X4.3X0.98 in) |
| **Weight** | 0.25 Kg (0.55 lb) |
| **Certifications** | CE |

# Sensor Recommendations

| Material | Description |
|---|---|
| **Stainless Steel** | For liquid applications.<br>High resistance in highly acidic and alcoholic environments.<br>Less sensitive to echoes (in Solid applications). |
| **Coated Aluminum** | Designed for complex environments with problematic echoes, such as non-conductive vapors, solids or liquids.<br>Good performance in problematic applications.<br>High sensitivity to echoes. |

# Chapter 2

# Installing MicroScan

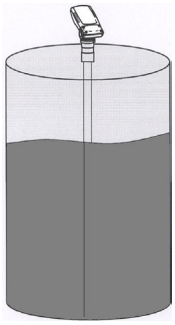
## Precautions

- Ensure that MicroScan is mounted in an area that meets the stated temperature, pressure and technical specifications.
- Ensure that high-voltage sources or cables are at least 1 m away from the sensor and its cable.
- Use a conduit connector that is either 1/2" NPT or M20x2.5 compatible (depending on the MicroScan model you have), to ensure the unit remains sealed.
- Use 26-16 AWG round wires for the MicroScan's electrical connections.
- Ensure that cables are routed correctly and tightened along walls or pipes.
- Installation and operation of this product should be performed, according to the Product User Manual and Product Certification, otherwise the use of this product is prohibited.

# Installing MicroScan

When installing MicroScan, ensure that it is:

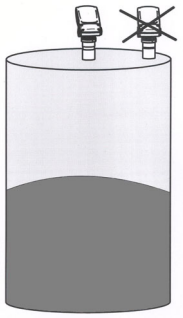
- Mounted above the dead-zone area.



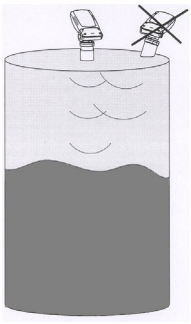
**NOTE:**

If the device enters the blocking distance (dead zone), it will not measure correctly.

- Positioned at least 0.5 m (1.64 ft) away from the tank walls.



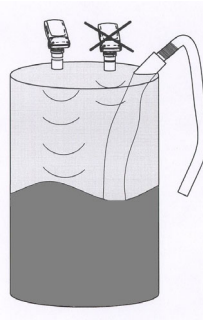
- Perpendicular to the surface of the target.



**NOTE:**

Even the slightest difference in angle may affect echo quality.

- Placed as far as possible from noisy areas, such as a filling inlet.



## Installing MicroScan on Threaded Flange/Thread-Free Flange

MicroScan is available in two thread types, 2" BSP or 2" NPT.

MicroScan can be installed with threaded-flange mounting or with thread-free flange mounting, as shown below:

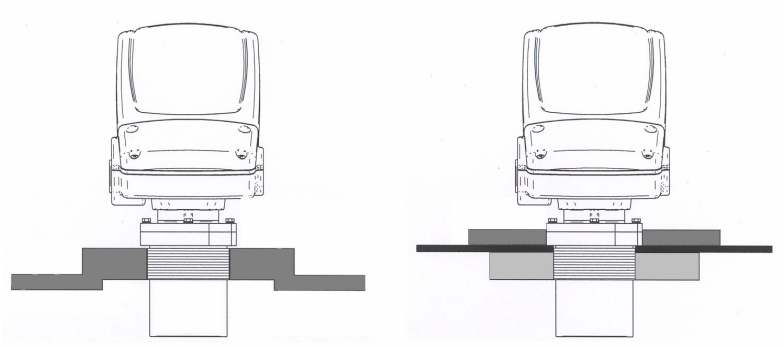


Figure 3: Threaded Flange/Thread-Free Flange Mounting

**NOTES:**

When installing a thread-free flange mounted unit, you will need a 2" locking nut to secure the unit inside the tank.

When installing a threaded flange, ensure that it matches the MicroScan threads.

### ➢ To install MicroScan:

**1** Insert the threaded end of MicroScan into the aperture at the top of the tank or pipe.

**2** Bolt MicroScan into place in one of the following ways:

- ✦ **Threaded-flange mounting**: Screw the unit into a flange with a threaded 2" hole.
- ✦ **Thread-free mounting**: Place MicroScan in the flange, and bolt it from within the tank with a 2" locking nut.

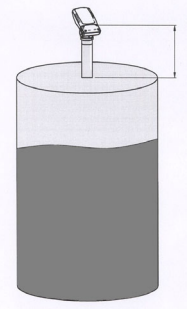
**NOTES:**

Tighten the nut by hand only. When tightening the nut, hold the sensor housing (refrain from holding the MicroScan unit when tightening the nut).Make sure that the seal is leak proof.

## Installing MicroScan via Extension Pipes

If the level of the measured surface falls within the dead-zone area, you should use an extension pipe to mount MicroScan.

When using an extension pipe, ensure that:



- ✦ The sensor is positioned in the center of the pipe.
- ✦ The pipe extension is parallel to the side/tank walls.
- ✦ The internal pipe diameter is at least 3" wide.

When installing the MicroScan with extension pipes, follow these specifications:

| Pipe Length | Internal Pipe Diameter |
|---|---|
| 0.50 m (1.64 ft) | 3" |
| 1 m (3.28 ft) | 3" |

**NOTE:**

It is always recommended to use interference signal feature (Pr.03) to locate interfering signals when using an extension pipe.

It is highly recommended that the extension pipes material would be PVC or Plastic and not Stainless Steel.

## Connecting the MicroScan to a Power Cable

1. Unscrew the four Allen screws from the MicroScan front door.
2. Detach the front door from the MicroScan unit.
3. Remove the rubber sealing from the conduit entry.
4. Thread the power cable through the conduit entry.
5. Remove the plastic shell from the power cable.
6. Connect the +24VDC wire to Terminal 1, connect the 0VDC (GND) wire to Terminal 2 on the wiring block.
7. Make sure that the terminals' screws are properly fastened.
8. Attach the front door to the MicroScan unit.
9. Screw the four Allen screws to the plastic door.

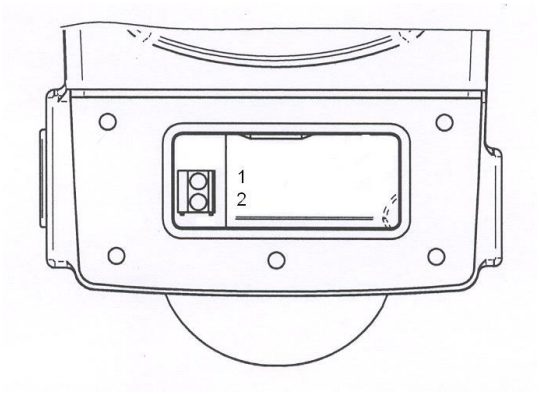



Figure 4: MicroScan Power Connections

**NOTE:**

Make sure that the O-Ring of the MicroScan's front door is properly positioned to maintain the unit sealed.

## Connecting the MicroScan to the MSU (MicroScan Setup Unit)

The MSU is an hand held device which enables you to configure the MicroScan unit according to your application requirements, quickly and simply. Once the MicroScan unit configuration is completed, the MSU can be utilized to configure other MicroScan units.

The MSU should be connected to the MicroScan unit after connecting the unit to a power supply.

1. Remove the plastic cap from the MSU connector located on the MicroScan unit (the cap is chained to the MicroScan unit).
2. Remove the plastic cover from the MSU multi-pin connector.
3. Attach the MSU male connector to the female connector on the MicroScan unit, located on its left side panel.
4. Make sure that the connectors are in the right position and properly attached.
5. Rotate the plastic clasp on the MSU connector, half way to the right, to ensure the connectors are firmly closed.

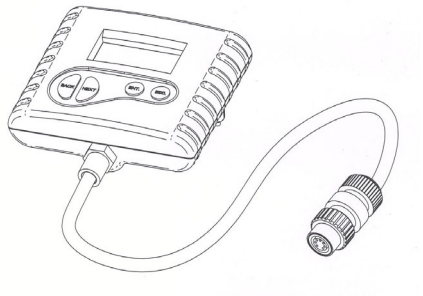


Figure 4.1: MSU Communication Connector

# Non-Intrinsically Safe Connections

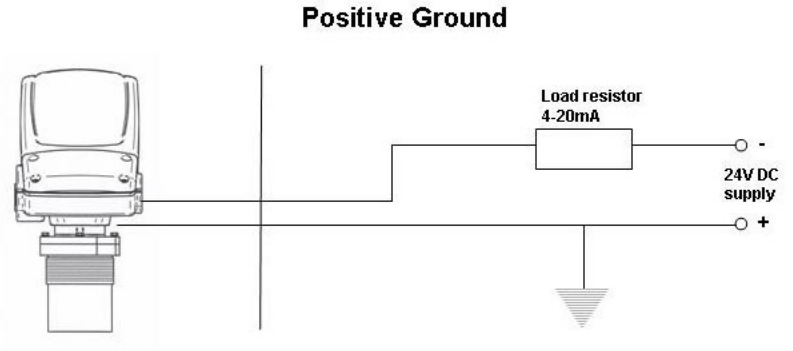



Figure 5: Non-Intrinsically Safe Positive Ground Connection

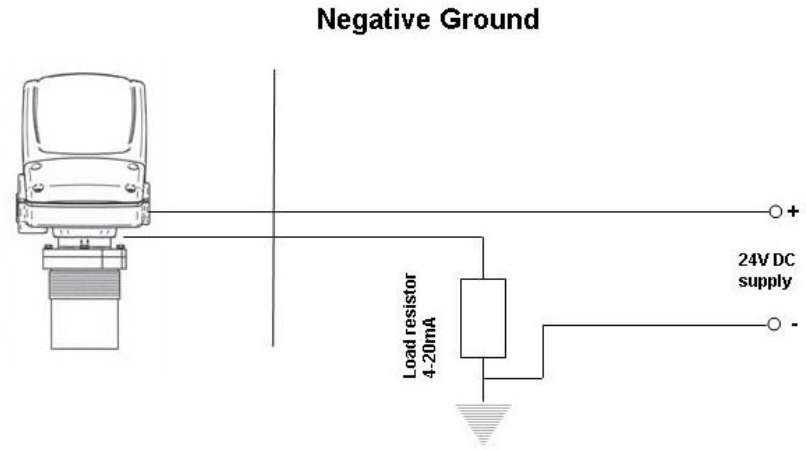



Figure 6: Non-Intrinsically Safe Negative Ground Connection

## Power Supply and Load Resistance Recommendations

The following table specifies the recommended resistance range for each power supply voltage (Non-Intrinsically Safe).

| Power Supply Voltage | Minimum Current on Resistor | Maximum Current on Resistor |
|---|---|---|
| 12 V | 0 Ω | 50 Ω |
| 15 V | 0 Ω | 220 Ω |
| 24 V | 41 Ω | 610 Ω |
| 28 V | 68 Ω | 820 Ω |

## Ripple/Noise Parameters Recommended for the Power Supply

**The following ripple/noise parameters are recommended for the power supply:**

- For less than 15 V: 75 mV p-p max
- For more than 15 V: 100 mV p-p max

# Chapter 3

# Setting Up and Calibrating MicroScan

This chapter explains how to set up and calibrate MicroScan for accurate measurement monitoring.

MicroScan is supplied with preprogrammed default settings, making it ready for immediate operation. There is no need to change the default settings, unless you wish to calibrate MicroScan for your specific requirements; however, it is recommended that you replace the default tank height value with the actual tank height, as described on page 21. When using MicroScan, the tank height is calculated as the distance from the surface of the sensor to the bottom of the tank. You should enter this value whenever tank height is required.

MicroScan contains nine programs, referred to as functions, which enable you to change the default settings and calibrate MicroScan as required. Changing the setting is available using the MicroScan Setup Unit (MSU). The MSU is a hand held device that enables you to enter the MicroScan functions and menus and set it up according to your application requirements. You can use the MSU to calibrate numerous MicroScan units in the field.

To facilitate the MicroScan unit set-up and configuration, mount the MSU on top of the unit, placing its four plastics pins on board the four screw holes of the MicroScan's front door, as illustrated below. Make sure that the MSU is properly situated on the MicroScan unit.

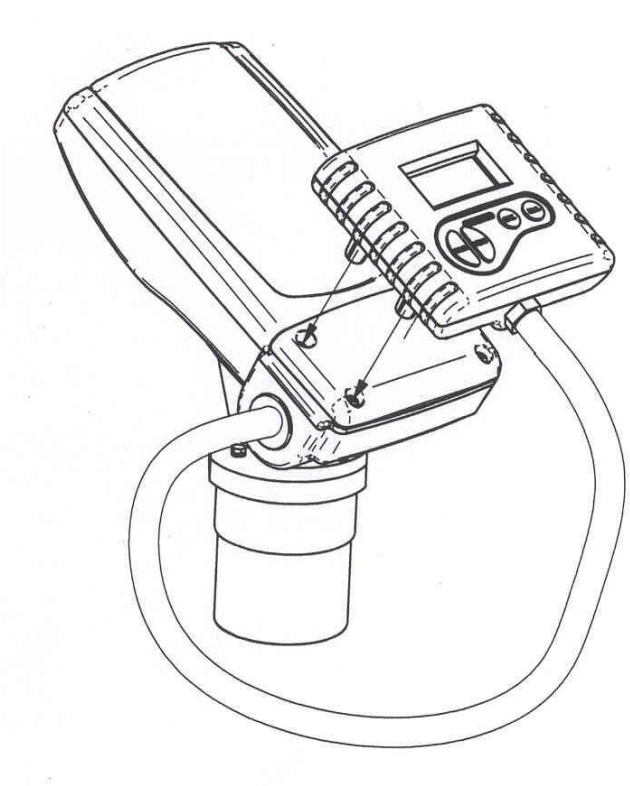


Figure 7: MSU mounted on the MicroScan unit

The MicroScan functions are accessed from a functions menu. The functions **Pr01**, **Pr02**, **Pr04** and **Pr05** are the most important to ensure correct usage of your MicroScan device.
Function **Pr03** is essential to eliminate interfering signals and false echoes that may exist inside the tank and sometimes are not visible to the human eye.

The remaining functions (**Pr06**, **Pr07, Pr08, Pr09**) enable you to customize MicroScan for your monitoring requirements or to restore factory default settings.

**NOTE:**

**Pr06** function is available only for MicroScan liquid models.

The diagram below shows the functions available in the functions menus for the MicroScan L and S models.

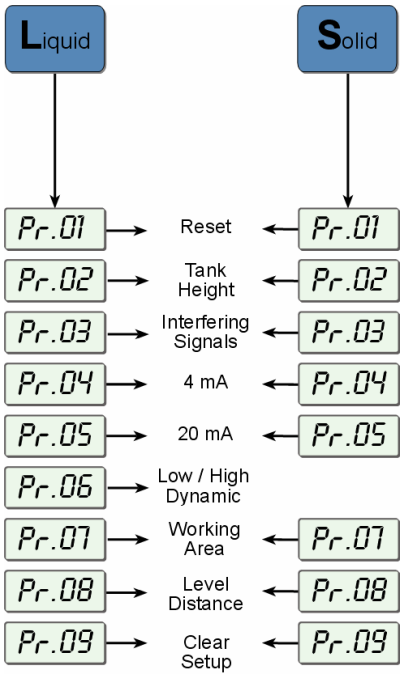



Figure 8: MicroScan Functions Menus

# Using MicroScan Functions

MicroScan has an optional LCD display screen that enables you to view continuous updated measurement readings, or by using the MSU's (MicroScan Setup Unit) LCD display screen. The display screen is used to view MicroScan's menu options, function settings and data values, accessed by using the MSU's function buttons.

The picture below shows the MSU LCD display and function buttons:

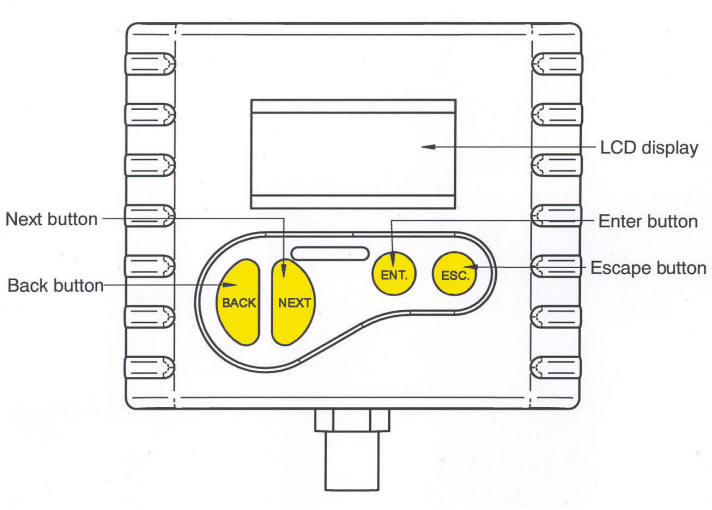



Figure 9: MSU Display and Function Buttons

**NOTE:**

When mounting the MSU on a MicroScan unit incorporating an LCD display, measurement results will be viewed only on the MicroScan display (the MSU' display will not function).

The function buttons are used to perform various operations, summarized in the following table.

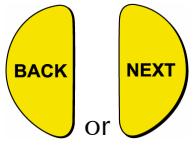
| Button | Uses Include: |
|---|---|
| ENT. | ✦ Accessing the functions menu (when pressed simultaneously with ESC.)<br>✦ Selecting functions<br>✦ Progressing to the next step of a function<br>✦ Moving from left to right between displayed digits (see note on the following page)<br>✦ Saving changes to data |
| ESC. | ✦ Accessing the functions menu (when pressed simultaneously with ENT.)<br>✦ Exiting the functions menu to restore the distance reading<br>✦ Moving from right to left between displayed digits (see note on following page)<br>✦ Exiting a function without saving changes<br>✦ Clearing error messages |
| BACK or NEXT | ✦ Scrolling through the functions menu<br>✦ Scrolling through available data values in functions<br>✦ **NEXT** button only: Recording interfering signals (see page 24) |

**NOTE:**

Within some functions, the digits in the displayed value can be individually modified. This is indicated by a flashing digit (flashing digits are shown in gray in the display illustrations, for example, 03.50). In this case, the **ENT** and **ESC** buttons enable you to move between the digits. Each flashing digit can be modified using the **BACK** and **NEXT** buttons.

### ➢ To start up MicroScan and access the functions:

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | Connect the MSU to the MicroScan unit (following the connection instructions described on Chapter 2.) | | |
| ⇨ | Connect the MicroScan unit to power supply | 8.8.8.8 | Temporary display while MicroScan takes a reading. |
| ⇨ | After a brief pause | For example: 3.227 | Distance reading. |
| ⇨ | ENT. and ESC. (simultaneously) | For example: Pr.01 | Enters the functions menu. |

⇨ 


Used to search for the required menu selection.

⇨ 


Accesses the selected function.

**NOTES:**

If an error message Err appears, press the **ESC** button to return to the main menu.

Values are displayed in meters and centimeters or feet and inches, according to the version of MicroScan.

## Pr.01 Resetting MicroScan

The **PR01** function enables you to do a reset, refreshing the MicroScan measurement reading. (Other saved function settings are not changed.) After resetting, a default reading is displayed on the MSU's (or the MicroScan's display, depending on the model) LCD, and MicroScan begins to scan (similar to disconnecting the unit from the power supply.)

The reset function may sometimes be required after changing one of the MicroScan's settings or after receiving an error message.

**NOTE:**

When the display shows 8.8.8.8 the 4-20mA current reading will be around 28mA.

➢ **To reset MicroScan:**

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | | Pr.01 | Required menu selection. |
| ⇨ | ENT. | 8.8.8.8 | Temporary display while MicroScan takes reading. |
| ⇨ | After a brief pause | For example, 3.227 | Distance reading. |
| ⇨ | ESC. and ENT. (simultaneously) | | Returns to the functions menu. |

## Pr.02 Entering the Tank Height Value

The **Pr02** function enables you to enter the tank height. The default value is the highest value in the relevant measurement range for your model. If you enter a value that exceeds this highest value, the **Err** error message is displayed and the value is not saved.

**NOTES:**

Whenever the tank height is required, you should enter the distance from the surface of the sensors to the bottom of the tank.

The first digit can be modified to read between 0 and 1 for metric units or between 0 and 5 for feet units.

➢ **To enter the tank height value:**

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | | Pr.02 | Required menu selection. |
| ⇨ | ENT. | H nn | Indicates the measurement unit, either meters or feet (according to the MicroScan version). |
| ⇨ | ENT. | For example 04.00 | Displays last saved tank height or default value (maximum value in range). |
| ⇨ | ESC. or ENT. or BACK or NEXT | | Used to enter a new value, as described on page 19. |
| ⇨ | ENT. | YES | To save the new value, press ENT. when standing on the far-right digit. After **YES** is displayed, the display returns to the functions menu. |
| | **OR** | | |
| ⇨ | ESC. | | To return to the main menu without saving, press ESC. when standing on the far-left digit. |

# Pr.03 Defining Interfering Signals

The **Pr03** function enables you to locate and store up to four interfering signals (false echoes) in the MicroScan memory, to avoid having obstructions such as a tank agitator, sidewall or any other obstructions that are not visible to the human eye and may interfere with the measurement of the contents. This function is essential to obtain accurate measurement results and therefore it must be activated prior to the completion of the unit's installation. Defining interfering signals should be done while the tank is empty.

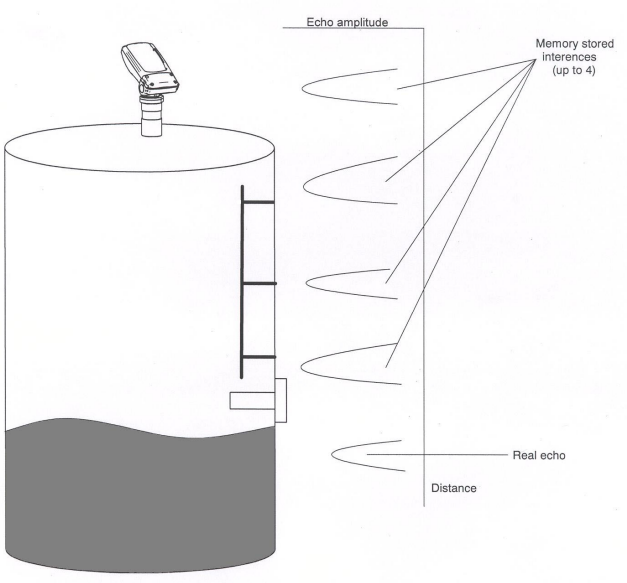



Figure 10: Scan Distance Process

Each reading (scan distance) taken using the **Pr03** function is stored as an interfering signal, until a reading is achieved that indicates the real echo. If four interfering signals are already stored and a fifth value is entered, the first value stored is deleted and the new one saved.

**NOTES:**

The reading of the actual target height may not be exact, for example, a target height of 4m may give a reading in the range 3.98 - 4.02.
**The displayed values are in distance units.**

### ➢ To define interfering signals:

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | | Pr.03 | Required menu selection. |
| ⇨ | BACK or NEXT | SrCH<br>CLr | Select *Search* to locate acoustic interferences, or *Clear* to delete stored interferences. |
| ⇨ | ENT. | YES | Displayed after the selection for 3 seconds and then the menu returns to Pr.03. |
| ⇨ | ENT. | 0.0.5.E | Temporary display while MicroScan searches for interfering signals. |
| ⇨ | After a brief pause | For example,<br>3.227 | Depth to interfering signal. |

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ |  | | Saves the interfering signal, then searches again and displays the next reading. Continue to press this button to save up to four interference readings. |
| ⇨ | | For example,  | Actual target height reading indicates that there are no more interfering signals. |
| ⇨ |  |  | Saves the entered values. |

**NOTES:**

If the value represents an interference or false echo or false target - press NEXT. If the value represents the real target, real distance – press ENT.

# Pr.04 Configuring 4mA Current Output

**Pr04** function enables you to enter values to be used as the 4mA mark for remote monitoring. You can define the 4mA values for Level or Distance measurements. The measurement values types should be defined in Pr.04. These definitions will be applicable for the 20mA values defined in Pr.05 as well. Distance and level measurements can be defined for both Solid and Liquid MicroScan models.

To set 4mA and 20mA for **level measurements** you should configure **Pr04** and **Pr05** for level values.
For example, if we measure a tank with tank height configured for 4 meters, the 4mA values will represent zero tank level and 20mA values will represent full tank level. Therefore, the value entered in **Pr04** will be 0.000m and the value entered in **Pr05** will be 4.000m.

When setting 4mA and 20mA for **distance measurements**, 4mA values will represent the minimal distance between the surface of the target and the sensor and 20mA values will represent the maximal distance between the sensor and the surface of the target. Therefore, 4mA and 20mA in this mode represent the empty part of the tank.

➢ **To enter 4mA values:**

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | | Pr.04 | Required menu selection. |
| ⇨ | BACK or NEXT | For example, L000 | Select 4mA (and 20mA) values format: Level (L000), Distance (d000). |
| ⇨ | ENT. | C004 | |
| ⇨ | ENT. | For example 00.00 | Last saved 4mA level or zero default value. |
| ⇨ | ESC. or ENT. BACK or NEXT | | Used to enter a new value, as described on page 19. |

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | ENT. | YES | To save the new value, press ENT. when standing on the far-right digit. After **YES** is displayed, the display returns to the functions menu. |
| ⇨ | ESC. | | To return to the main menu without saving, press ESC. when standing on the far-left digit. |

**NOTES:**

The values for 4mA and 20mA must be different; otherwise an **Err** error message is displayed.
The values for 4mA and 20mA should not be higher than the value used for the tank height (**Pr02**), and should not be lower than the dead-zone value. Because of the dead-zone, the distance between the sensor and the surface of the target at its highest level should be a minimum of 0.6 ft/0.2 m for Short-Range models, or 1.96 ft/0.6 m for Standard-Range models.
The first digit of the 4mA value can be modified to read between 0 and 1 for metric units or between 0 and 5 for U.S. Standard units.
After accessing the **Pr04** function, the unit generates a fixed current of 22mA on the 4-20mA line. When the MicroScan reverts to regular scanning mode, the 4-20mA line returns to regular functioning.

The default values for 4mA and 20mA in Solid and Liquid MicroScan models are level.

The measurement mode selected for the 4-20mA values will not influence the measurement mode selected for the display (**Pr.08**).

In case of power rest, measurement configuration (level, distance) will be saved according to the unit's last configuration.

# Pr.05 Configuring 20mA Current Output

The **Pr05** function enables you to enter values to be used as the 20mA mark for remote monitoring.

➢ **To enter 20mA values:**

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | | Pr.05 | Required menu selection. |
| ⇨ | ENT. | C020 | |
| ⇨ | ENT. | For example 04.00 | Last saved 20mA level or default value (maximum value in range). |
| ⇨ | ESC. or ENT. or BACK or NEXT | | Used to enter a new value, as described on page 24. |
| ⇨ | ENT. | YES | To save the new value, press ENT. when standing on the far-right digit. After **YES** is displayed, the display returns to the functions menu. |

**OR**

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | ESC. | | To return to the main menu without saving, press ESC. when standing on the far-left digit. |

**NOTES:**

Type of measurement (level, distance) selected in Pr.04 is also applicable for Pr.05.

The values for 4mA and 20mA must be different; otherwise an **Err** error message is displayed.

The values for 4mA and 20mA should not be higher than the value used for the tank height (**Pr02**), and should not be lower than the dead-zone value.

The first digit of the 20mA value can be modified to read between 0 and 1 for metric units or between 0 and 5 for U.S. Standard units.

After accessing the **Pr05** function, the unit generates a fixed current of 22mA on the 4-20mA line.

When the MicroScan reverts to regular scanning mode, the 4-20mA line returns to regular functioning.

Please refer to chapter 4 "Troubleshooting" for 22mA error indications.

# Pr.06 Selecting Low/High Dynamic Speed (Liquid Only)

The **Pr06** function enables you to choose the required speed and accuracy level. There are two settings available:

- **SE 0**: Low dynamic mode (default setting). This mode enables more accurate measurements resulting in a slower filling rate.
- **SE 1**: High dynamic mode. This mode enables a faster filling rate, providing less accurate measurement results.

➢ **To select the speed mode:**

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | | Pr.06 | Required menu selection. |
| ⇨ | ENT. | SE 0 or SE 1 | Displays the current operation mode setting. |
| ⇨ | BACK or NEXT | | Used to toggle between the operations modes. |
| ⇨ | ENT. | YES | Saves the selected operation mode. |

# Pr.07 Defining Working Area

The **Pr07** function allows you to add distance range that exceeds the tank's height, thus enabling accurate readings of complicated tank shapes with conic ending. This may be required when the vessel has a conical bottom shape which is causing false echoes and consequently faulty measurements. The entered range can be from the minimum tank height to twice the maximum measuring range of the MicroScan (depending on the MicroScan model). The default setting is the entered tank height.

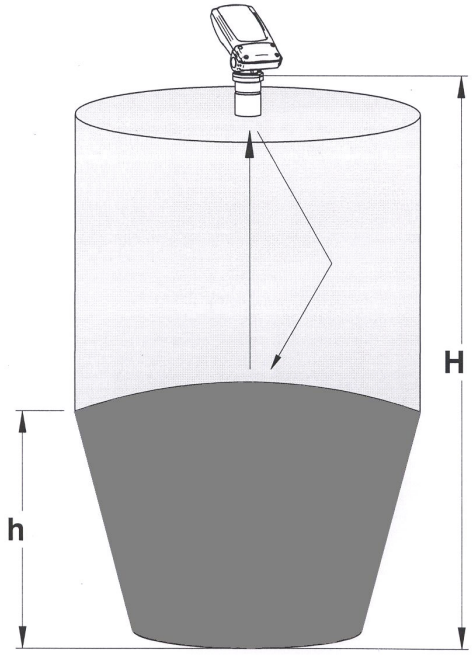



Figure 11: Defining Working Area

➢ **To define a Working Area:**

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | | Pr.07 | Required menu selection. |
| ⇨ | ENT. | ArEA | Displayed when entering the function. |
| ⇨ | ENT. | for example: 04.00 | Displays the value last saved in the tank height (default). To overcome conical shaped tanks, enter a value that is up to double the tank height. The entered value should not be more than double the tank height and should not exceed the MicroScan's maximum measuring range. |
| ⇨ | ESC. or ENT. BACK or NEXT | | Used to enter a new value, as described on page 19. |
| ⇨ | ENT. | YES | Saves the entered value. |

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | BACK or NEXT | | Used to move on to the next function. |

NOTE:

It is recommended to use the **Pr.07** function only in ***Distance*** mode.

## Pr.08 Selecting Distance or Level Display

The **Pr08** function enables you to view either distance or level measurements on the MSU or MicroScan LCD display (depending on the model).

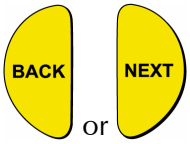
There are two settings available:

- **d000**: Distance mode (default setting): In this mode, MicroScan displays the distance from the sensor to the surface of the contents.
- **L000**: Level mode: In this mode, MicroScan displays the level of the contents from the bottom of the tank.

NOTE:

The measurement mode selected for the display will not influence the measurement mode selected for the 4-20mA values (**Pr.04**).

➢ **To select distance or level display:**

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | | Pr.08 | Required menu selection. |
| ⇨ |   | d000 or L000 | Displays the current distance/level mode setting. |
| ⇨ |   or | | Used to toggle between the modes. |
| ⇨ |   | YES | Saves the selected mode. |

# Pr.09 Restoring the Default Settings

The **Pr09** function allows you to clear all user-defined settings and revert to the default factory settings.

**NOTE:**

If you decide that you do not want to revert to the default settings, press **ESC** when **CLCL** is displayed. A redo option is not available when **ENT** has been pressed.

➢ **To restore the default settings:**

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | | Pr.09 | Required menu selection. |
| ⇨ | ENT. | CLCL | |
| ⇨ | ENT. | YES | Reverts all settings to default factory settings. |

# Shifting the Blocking Distance

This function enables you to define an area in which measurement results would be ignored. This option is applicable for installations requiring extension pipes or nuzzles positioned above the material level. This area should fit the pipe/nuzzle length to eliminate false echoes and to provide accurate and stable measurement readings.

➢ **To shift the blocking distance:**

Follow the directions given for *Entering the Tank Height Value*, page 22. Instead of entering the tank height value, enter **00.01**, and continue as follows:

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | | 00.01 | Insert this code to enter the Blocking Distance area. |
| ⇨ | ENT. | Sdb | This message will flash for a few seconds, indicating an entry to the Blocking Distance area. |
| | BACK or NEXT | For example, 00.75 | To shift the blocking distance to 0.75m (2.46 ft). |
| ⇨ | ENT. | | To save this entry and return to Pr.02. |

**NOTES:**

The Blocking Distance shifting is limited to 1.5m/4.9ft.

Echo received from the defined Blocking Distance area will be ignored by the MicroScan and the measurement result will be based on the next echo.

Pr.09 (Clear) will revert the blocking distance to its default.

# Verifying the Version Number

In addition to the functions described, you can verify the MicroScan version number.

➢ **To verify the MicroScan version number:**

Follow the directions given for *Entering the Tank Height Value*, page 22. Instead of entering the tank height value, enter **00.17**, and continue as follows:

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | ENT. | YES | |
| ⇨ | After a brief pause | Addr | |
| ⇨ | ENT. | | Displays the version number. |

# Defining 22mA Signal Error Messages

MicroScan allows you to define if the following signal error indications: Near Zone and Lost Echo will be active when the current output reaches 22mA. The MicroScan default setting disables 22mA analog current and error messages from appearing on the MSU (or MicroScan) LCD display.
**Near Zone** - whenever the distance is below the defined Dead Zone (depending on the MicroScan model you are using) F.F.F.F message will be displayed on the MicroScan's LCD.
**Lost Echo** - whenever the echo is lost, or in cases when the

measurement results exceed the tank height or when a returned echo is not received E.E.E.E message will be displayed on the MSU (or MicroScan) LCD.

You can choose to enable or disable these error messages and 22mA analog signal as follows:

- **d000**: Disable (default setting)
- **E000**: Enable

Refer to Chapter 4, *Troubleshooting* for a detailed list of the 22mA signal error messages.

### ➢ To enable 22mA signal error in the MicroScan:

Follow the directions given for *Entering the Tank Height Value*, page 22. Instead of entering the tank height value, enter **00.16**, and continue as follows:

| | Press/Action | Display | Explanation |
|---|---|---|---|
| ⇨ | ENT. | E000 | Choose enable (or disable). |
| ⇨ | BACK or NEXT | | Used to toggle between the modes. |
| ⇨ | ENT. | YES | Enables the 22mA error messages. |

# Chapter 4

# Troubleshooting MicroScan

This chapter describes how to resolve problems that may occur when calibrating MicroScan, as follows:

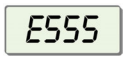
| Error | Description | Solution |
|---|---|---|
| EC11 | Noise in area. | Check that the power supply is appropriate. |
| E555 | Faulty power supply. | Make sure that the power supply corresponds with the specifications described in *Chapter 2, Installing MicroScan*. If the problem persists, replace the power supply. |
| 5544 | Sensor disconnected. | Contact the distributor for further instructions. |
| 8818 | Any combination of three 8s and one 1: Indicates an electrical shortage caused by depressing the buttons for too long. | Contact the distributor for further instructions. |

| | | |
|---|---|---|
| 8.8.8.8 | Appears for several seconds after restarting the unit. If it is displayed for more than several seconds, it may be due to one of the following:<br>✦ Power supply voltage is too low<br>✦ Load resistor resistance is too high or unnecessary<br>✦ A random pulse that causes the unit to automatically restart | Make sure that the power supply corresponds with the specifications described in *Chapter 2, Installing MicroScan*. If the problem persists, replace the power supply. |

## 22mA Signal Error Messages

The following list of messages will appear on the display and coincides with a 22mA analog current error output signal:

| Error | Description | Solution |
|---|---|---|
| 5544 | Sensor disconnected. | Contact the distributor for further instructions. |
| F.F.F.F | Near dead zone. | Move the sensor farther from the dead zone area. |
| E.E.E.E | Tank empty. | Check the level of material in the tank. |
| EC11 | Noise in area. | Check that the power supply is appropriate. |

| | | |
|---|---|---|
|  | Faulty power supply. | Make sure that the power supply corresponds with the specifications described in *Chapter 2, Installing MicroScan*. If the problem persists, replace the power supply. |

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