

Dresser Roots Meters & Instruments

IMC/W2 User Terminal

Manual

4-2819 Revision 10

PH029

Contents

1	Information	4
2	General Overview	5
3	Safety	6
4	Installation and Getting Started	7
4.1	System Requirements	7
4.2	Installation	7
4.3	Operating the MCUT	7
4.3.1	Connecting the IMC/W2 and PC via Direct Communications	8
5	Welcome Screen	9
6	Configuration Screen	10
6.1	Connect with MC – Direct Connection to the IMC/W2	11
6.2	Upload to MC	11
6.3	Volume Configuration	12
6.3.1	Volumes	12
6.3.2	Flow	13
6.3.3	Pulse Outputs	14
6.3.4	Meter Data	15
6.3.5	Display	16
6.3.6	Pulse Output Allocation	17
6.4	Corrections Configuration	17
6.4.1	Temperature Measurement	18
6.4.2	Pressure Measurement	19
6.4.3	Supercompressibility	22
6.4.4	Differential Pressure Monitoring	23
6.5	Set Date & Time	24
6.6	Customize LCD	25
6.7	MC Comms Settings	28
6.7.1	Call Monitor Setup	28
6.7.2	Email Setup	32
6.7.3	Dial Out Alert Option	36
6.8	Save Configuration File	38
6.9	Open Configuration File	38
6.10	UT Comms Settings	38
6.11	Create Report	40
6.12	Report Viewer / View Release Notes	41
7	Calibration Screen	42
7.1	Temperature Single Point Calibration	43
7.2	Temperature Zero and Span Calibration	44
7.3	Pressure Single Point Calibration	45
7.4	Pressure Zero and Span Calibration	45
7.5	Monitor Pressure Single Point Calibration	46
7.6	Monitor Pressure Zero and Span Calibration	46
8	Live Data Screen	48
9	Faults & Alarms Screen	50
9.1	Clear Occurred Faults	51
9.2	Clear Uncorrected Volume Under Fault	51
9.3	Fault Dialout Settings	52
9.4	Clear Occurred Alarms	53
9.5	Alarm Settings	53
9.6	Alarm Dialout Settings	55
9.7	Monitor Calls	56
10	Advanced Screen	59
10.1	Trim Table	60
10.2	Prover Mode	61
10.3	Test Pulse Outputs	62
10.4	Change Password	63
10.5	Change Advanced Password	63
10.6	External Power or Digital Input/Output selection	64
10.6.1	External Power	64
10.6.2	Digital Input	64
10.6.3	Consumption Alarm Output	65

10.7	DP Measurement.....	66
11	Logging Screen.....	67
11.1	Logging Setup.....	68
11.1.1	Logged Parameters.....	69
11.1.2	Log1, Log2 and Log3.....	70
11.2	Download Data Log.....	70
11.2.1	Download <i>Log1</i> , <i>Log2</i> and <i>Log3</i>	71
11.2.2	Options.....	72
11.2.3	Downloaded Volume Units.....	72
11.3	Download Audit Log.....	72
12	Monitor Pressure.....	75
13	Modem Communications.....	76
14	Password Protection.....	77
15	Weights and Measures Link Protection.....	79
16	The IMC/W2 LCD Displayed <i>Messages</i>	81
	Appendix A – Terminology Used.....	84
	Appendix B – MCUT Software Licence Agreement.....	86

1 Information

This manual details the installation and operation of all varieties of the Dresser ROOTS® Micro Corrector, Model IMC/W2. The Micro Series Corrector and Micro Series Corrector User Terminal are manufactured by:

Dresser Roots Meters & Instruments
Unit 1, Yeoman Industrial Park
Test Lane
Nursling
Southampton
Hampshire
SO16 9JX
United Kingdom

Tel: +44 (0)23 8087 5600

Fax: +44 (0)23 8087 5601

Your local agent / Dresser Representative is:

All printed material contained within this manual is for information only and is subject to change without notice. This manual should be read in conjunction with firmware version **1.83 and higher** and Micro Corrector User Terminal software version **2.0.1.3**.

This manual uses the words corrector, corrected and uncorrected throughout. The words corrector, corrected and uncorrected should be read in Europe as meaning converter, converted and unconverted as defined by the most recent standards on volume conversion.

In addition, the term *telemetry output pulse* should be read in the USA as meaning *pulse output*.

In the case of the IMC/W2 T-Only and when a fixed line pressure is applied, the corrected and uncorrected volumes should be read as meaning compensated and uncompensated.

For the purpose of this document the terms PC and laptop should be considered as being interchangeable.

2 General Overview

The Dresser ROOTS® Micro Corrector, Model IMC/W2 with magnetic pickup volume input, combines two devices; an electronic counter and a volume corrector, and is designed to measure live pressure and temperature and to use the gas constituents in order to calculate corrected volume.

The IMC/W2 is installed directly on to all ROOTS® Meters and rotary meters of other manufacturers (contact your Dresser Representative for further details). Volume is sensed from the rotation of the impellers via a magnetic pickup which employs a Wiegand sensor in the design, therefore the input signal to the electronic counter and volume corrector is of high resolution. This translates into an extremely high level of accuracy of volume measurement and correction. Furthermore, the lack of a mechanical counter increases the rangeability of the gas meter by reducing the flow required to start the meter rotating.

Note: A temperature only version of the IMC/W2, the IMC/W2 T-Only is available. The IMC/W2 T-Only measures live temperature and calculates supercompressibility. The operator is required to configure a fixed line pressure value. All functionality, with exception of the live pressure measurement is identical to that of the IMC/W2, and the details contained within this manual should be read as being applicable to both.

A monitor pressure version is available. An external pressure transducer allows for additional upstream pressure monitoring. Configurable monitoring features are available for this Micro Corrector version.

A differential pressure version is also available, the IMC/W2-dp. A differential pressure (DP) transducer module is mounted onto the back of the Micro Corrector unit. This module houses inlet and outlet DP transducers. Configurable diagnostics capabilities are available for this Micro Corrector version.

The Micro Series Corrector User Terminal Software (MCUT) enables the operator to configure, calibrate, extract data and monitor alarms. A logging facility is also available; data logging and audit logging. The operator is able to specify which parameters are logged within the data log and the logging interval at which the logs are taken. The audit log provides a tracking facility detailing any parameter changes; only the parameter changes that will affect the billing are included within the audit log. To ensure the integrity of the billing period, the audit log cannot be deleted.

3 Safety

All IMC/W2 installations must meet Intrinsic Safety requirements. Ensure that the installation is carried out in an appropriate manner in accordance with any National Codes of Practice dealing with Intrinsically Safe (I.S.) installations; refer to the *Integral Micro Series Volume Corrector Model IMC/W2 manual (PH028)* (sections 4 (*Safety*) and 5.2 (*Installation Safety Requirements*)).

Connection to intrinsically safe equipment must be properly assessed by the user and the manufacturer (Dresser) will not take responsibility for the overall safety of the system.

The serial port may only be connected to an intrinsically safe modem as shown by the system approval drawing. For commissioning and reading data the serial port may also be connected to a laptop computer under the following conditions:

1. Laptop computers, generally, are not intrinsically safe. Therefore, before using an uncertified laptop in the hazardous area, a gas test should be performed to prove that no potentially hazardous gas mixture exists in the area. If this is not possible the laptop must not be used in the hazardous area.
2. The laptop computer must be powered by batteries alone and these must be incapable of supplying more than 25 Volts. No connection is to be made to an external supply (e.g. charger) even if non-operational. (The presence of the connection can itself create a hazardous condition).

4 Installation and Getting Started

4.1 System Requirements

The MCUT is designed to run on Windows® based PC's running Windows 95, 98, 2000, ME, NT4, XP, and Vista. A CD-ROM drive is required for installation

Note: If GSM modem is used with IMC/W2 then it has to have 1.90G version of firmware or newer.
If internal PC modem is used then Windows XP has to be an operating system.

4.2 Installation

The MCUT software is supplied on CD as standard (please contact your Dresser Representative for further details if alternative installation media is required).

Insert the MCUT software installation CD into the CD-ROM drive of the PC. If the auto run facility is enabled on the PC, the set up program will start automatically the first time the CD is inserted.

If the set up program does not start automatically the following steps should be performed:

From the Start menu, locate Windows Explorer:

- For **Windows 95, 98 and NT4** this can be found from the Start menu by selecting *Programs*, then *Windows Explorer*.
- For **Windows 2000, ME, XP, and Vista** this can be found from the Start menu by selecting *Programs*, then *Accessories*, followed by *Windows Explorer*.
- Select the CD-ROM drive under *My Computer*.
- Double click SETUP.EXE from the contents list.
- Follow the on-screen instructions thereafter.

Note: Installation of the software on the PC is subject to the terms of the licence agreement displayed during the installation process. You should not use the software until you have read the licence agreement. By using the software you signify that you have read the licence agreement and accept its terms. Please refer to [Appendix B \(MCUT Software License\)](#).

4.3 Operating the MCUT

Communications to the IMC/W2 can be carried out either directly or remotely. An intrinsically safe barrier (or Dresser Micro or GSM Modem) must be installed between a PC in a non-hazardous area and the IMC/W2 in the hazardous area. It is possible to specify which communications port is to be utilized while operating in the direct mode. The procedures contained within this manual are identical regardless of whether communications to the IMC/W2 are carried out directly or remotely via the modem, however the operator will be prompted to enter some additional details if remote communications are to be established (e.g. select the type of PC modem, enter telephone numbers etc). Please refer to section [12 \(Modem Communications\)](#) for further details.

All of the procedures outlined below (with the exception of sections [9.7 \(Monitor Calls\)](#) and [12 \(Modem Communications\)](#)) are described using the direct method of communication and therefore assume that the communications cable (supplied in the communications pack) is connected between the PC and IMC/W2.

4.3.1 Connecting the IMC/W2 and PC via Direct Communications

For direct communications connect the 9 way “D” type connector of the communications cable to COM port 1 on the PC; connect the round connector to the serial port connector located in the right hand corner on the bottom of the IMC/W2. If COM port 1 is not available it is possible to specify which COM port is to be used within the MCUT for direct communication (COM 1 to COM 8).

To start the MCUT:

- Locate and run the icon created on the desktop during the installation process. Alternatively select the *MC UT* icon from the *Micro Series User Terminal* folder in the *Start, Programs* menu.
- Once either icon has been selected the *Welcome* screen will be displayed. Select the *Configuration* tab.
- Select the *UT Comms Settings* option. The *UT Comms Settings* dialog will be displayed.
- From within the *Direct* section select the *Com Port* drop down selection box. Select the appropriate COM port (that which the communications cable is connected to), default is COM 1.
- Select the *OK* option within the *UT Comms Settings* dialog. The *Configuration* screen will be displayed.
- Select the *Connect with MC* option.
- Communication will be established. A *progress bar* will begin to move from left to right across the screen as the data is downloaded.

5 Welcome Screen

The software version and release date of the user terminal is displayed within the *Welcome* screen. In order to connect to the IMC/W2 it is necessary to select the *Configuration* tab to display the *Configuration Screen*.



Figure 1 - Welcome Screen

Please note the software version if customer support is requested.

6 Configuration Screen

The *Configuration* screen is divided into 3 main sections; the left hand parameter selection list, 9 options which allow the operator to connect and configure the IMC/W2, and the report generation section.

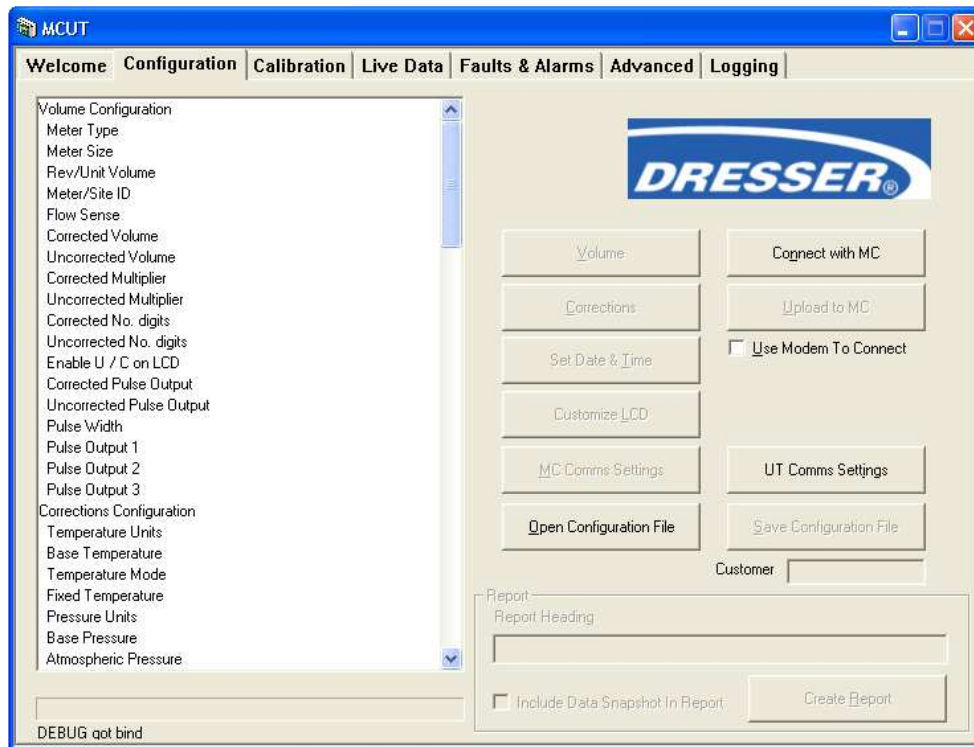


Figure 2 - Configuration Screen

Before communications have been established between the PC and IMC/W2 several of the options within the *Configuration* screen will not be selectable. This is because the contents of these dialog boxes depends on the information stored within the IMC/W2. Before changes can be made to the configuration data stored within the IMC/W2, the existing configuration data must be downloaded from the unit. Once the PC and IMC/W2 have successfully established communications, the previously unavailable options within the *Configuration* screen will become available, and changes to the configuration data can be made and uploaded.

To display the configuration screen:

- From within the MCUT select the *Configuration* tab. The *Configuration* screen will be displayed.
- The options available on this screen depend on the model and configuration of the IMC/W2.
- Upon initial call up of this screen (which must be done every time the MCUT is run) it is necessary to download the configuration data from the IMC/W2 so that the current settings stored within the IMC/W2 are displayed in the MCUT.
- Select the *UT Comms Settings* option. The *UT Comms Settings* dialog will be displayed.
- From within the *Direct* section select the *Com Port* drop down select box. Select the appropriate com port (the one which the communication cable is connected to).
- Select the *OK* option within the *UT Comms Settings* dialog. The *Configuration* screen will be displayed.
- Select the *Connect with MC* option. For further details refer to section [6.1 \(Connect with MC – Direct Connection to the IMC/W2\)](#).

6.1 Connect with MC – Direct Connection to the IMC/W2

To connect to the IMC/W2 directly select the *Connect with MC* option (if no com port is otherwise specified COM1 will be used by default). Please refer to section [12 \(Modem Communications\)](#) for details about connection to the IMC/W2 via a modem.

Once the download is complete a dialog will be displayed stating that *Configuration Downloaded OK*, select *OK*.

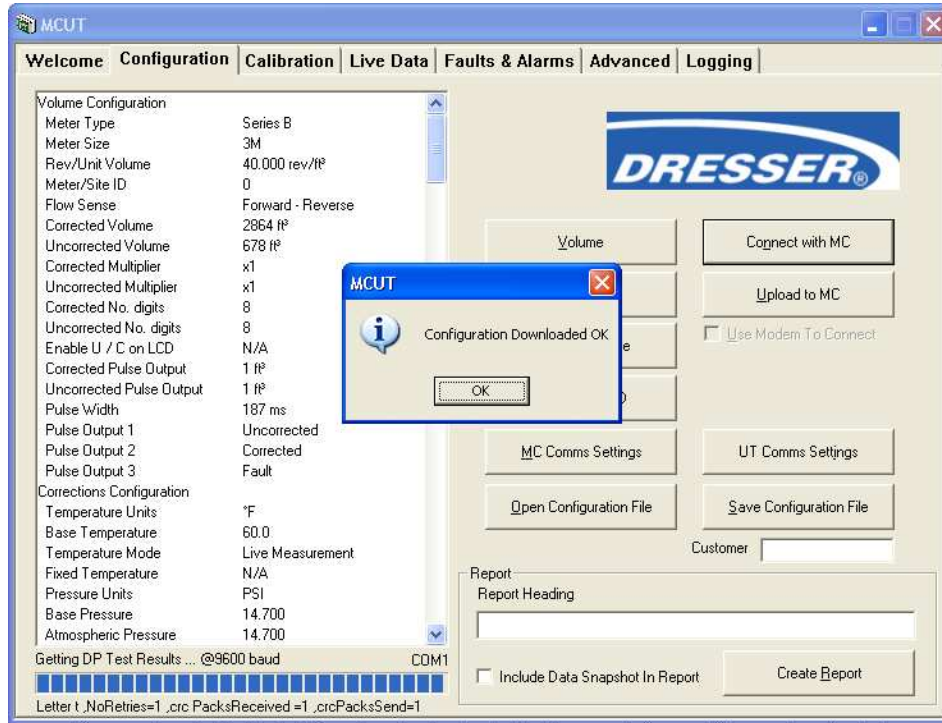


Figure 3 - Configuration Downloaded OK Dialog

Once *OK* is selected, all options within the *Configuration* screen will become available; it is now possible to setup and configure the unit.

6.2 Upload to MC

After the configuration data has been changed in the MCUT screen, upload the new parameter details to the IMC/W2. Prior to upload, any parameters that have been changed are highlighted yellow in the parameters selection list; after the parameters have been uploaded to the IMC/W2 the yellow highlights will be removed.

If a parameter is highlighted red, this means that the value entered within that text box is out of range. If the operator attempts to proceed, a dialog box will be displayed informing them of the appropriate valid range that should be entered for that parameter.

To upload any changes made within the MCUT, select *Upload to MC*.

Note: If the IMC/W2 is US configured it may be necessary to enter a password in order to upload the changes; the default password is the numerical value 0. If the IMC/W2 is protected by the read / write link (*Weights and Measures* legislation) it may not be possible to upload the changes made. Please refer to sections [13 \(Password Protection\)](#) and [14 \(Weights and Measures Link Protection\)](#) for further details.

6.3 Volume Configuration

The *Volume Configuration* dialog is divided 6 sections and the parameters that can be changed within this dialog:

- Volumes – enables the operator to specify corrected and uncorrected volume totals.
- Flow – enables the operator to specify which direction(s) of flow should be used to measure the volumes.
- Pulse Outputs – enables the operator to specify the value for corrected and uncorrected volumes, and the pulse width of both of these output pulses.
- Meter Data – enables the operator to specify the type and size of meter that the IMC/W2 is assembled to. Additionally, the operator is able to allocate a Meter / Site ID to each specific IMC/W2. This field can be a combination of 16 alpha-numeric characters however, special characters not recognized in Microsoft™ file names, cannot be entered in this field.
- Display – enables the operator to specify how the corrected and uncorrected volumes are displayed.
- Pulse Output Allocation – enables the operator to select uncorrected, corrected or fault pulses separately for each Pulse Output i.e. 1, 2 and 3.

The screenshot shows the 'Volume Configuration' dialog box with the following settings:

- Volumes:** Compensated Volume: 2215 ft³; Uncompensated Volume: 1098 ft³
- Flow:** Flow Sense: Forward - Reverse
- Pulse Outputs:** Compensated: 10 ft³; Uncompensated: 10 ft³; Pulse Width: 125 ms
- Pulse Output Allocation:** Pulse Output 1: Uncorrected; Pulse Output 2: Corrected; Pulse Output 3: Fault
- Meter Data:** Type: Series B; Size: 2M; rev/ft³: 50; Meter/Site ID: 0
- Display:** Compensated Volume: 00002215 (Multiplier: x1, Digits: 8); Uncompensated Volume: 00001098 (Multiplier: x1, Digits: 8)

Figure 4 - Volume Configuration Dialog

To display the volume configuration dialog:

- From the *Configuration* screen select the *Volume* option. The *Volume Configuration* dialog will be displayed.

6.3.1 Volumes

It is possible to change the corrected and uncorrected volumes once the data within the IMC/W2 has been downloaded to the MCUT.

The *Volumes* section on the *Volume Configuration* dialog contains 2 text boxes labeled *Corrected Volume* and *Uncorrected Volume*; these text boxes enable the operator to change the values of the corrected and uncorrected volumes.

To set the Corrected and Uncorrected volumes:

- From within the *Configuration* screen select the *Volume* option. The *Volume Configuration* dialog will be displayed.
- From within the *Volumes* section enter the desired value in the appropriate text box. The new value will be highlighted yellow. A maximum of 9 digits can be entered in the MCUT for the corrected and uncorrected volumes. Note: The LCD of the IMC/W2 can only display a maximum of 8 digits; the value that is to be displayed on the LCD is shown in the *Display* section of the *Volume Configuration* dialog.
- Select the *OK* option within the *Volume Configuration* dialog.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow in the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. On completion a dialog will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white background. This color change from yellow to white indicates that the values displayed on the screen matches the values in the unit, therefore the upload was successful.

6.3.2 Flow

The IMC/W2 measures the flow from the meter via a magnetic pickup which is installed inside the mag well of the meter. The *Flow* section on the *Volume Configuration* dialog contains 1 drop down selection box labeled *Flow Sense*. In this drop down selection box, the user can specify which flow sense is identified as the positive and negative flow, along with how the flow should be calculated. The various flow sense configurations are described in Table 1 (*Flow Sense Configurations Reference Table*).

Table 1 – Flow Sense Configurations Reference Table

Flow Sense	Measured Flow Source		
	Forward	Reverse	Calculated Flow
Forward – Reverse	✓	✓	Volume in Reverse flow is subtracted from the volume calculated in Forward flow. Reverse flow will be indicated with a “-” symbol.
Reverse – Forward	✓	✓	Volume in Forward flow is subtracted from the volume calculated in Reverse flow. Forward flow will be indicated with a “-” symbol.
Reverse	✘	✓	Volume in Reverse flow only is calculated. All flow in the Forward direction is ignored.
Forward	✓	✘	Volume in Forward flow only is calculated. All flow in the Reverse direction is ignored.
Forward + Reverse	✓	✓	Volume in Reverse and Forward flow are calculated. Calculated volume is the total of all flow in both directions.

To set the required flow sense:

- In the *Configuration* screen select the *Volume* option. The *Volume Configuration* dialog will be displayed.
- In the *Flow* section select the desired option from the drop down selection box labeled *Flow Sense*. Details of the options are described in Table 1 (*Flow Sense Configuration Reference Table*). The new option selected will be highlighted yellow.
- Select the *OK* option within the *Volume Configuration* dialog.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow in the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. On completion a dialog will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

6.3.3 Pulse Outputs

The pulse output can be configured as 0.1, 1, 10, 100 and 1000, and describe the volume units per output pulse can be either metric or Imperial. For example if the corrected pulse output is set to 100 ft³, 1 output pulse will be generated for every 100 ft³ received, see Table 2 (*Pulse Output Reference Table*) for further details. In addition the pulse width of the output pulses can be set to 62.5, 125, 187 or 315 ms.

Table 2 – Pulse Output Reference Table

Corrected Pulse Output (ft ³)*	Condition for Output Pulse Generation
1 ft ³	For every 1 (corrected) cu ft received
10 ft ³	For every 10 (corrected) cu ft received
100 ft ³	For every 100 (corrected) cu ft received
1000 ft ³	For every 1000 (corrected) cu ft received
Uncorrected Pulse Output (ft ³)*	Condition for Output Pulse Generation
1 ft ³	For every 1 (Uncorrected) cu ft received
10 ft ³	For every 10 (Uncorrected) cu ft received
100 ft ³	For every 100 (Uncorrected) cu ft received
1000 ft ³	For every 1000 (Uncorrected) cu ft received
* For m ³ all instances of ft ³ / cu ft should be read as m ³ .	

Note: The *Corrected Pulse Outputs* and *Uncorrected Pulse Outputs* are independent of one another; therefore the corrected and uncorrected pulse outputs may be set as different values. This is particularly useful when working with high correction factors.

The *Pulse Outputs* section on the *Volume Configuration* dialog contains 3 drop down selection boxes labeled *Corrected*, *Uncorrected* and *Pulse Width*.

To set the pulse outputs:

- In the *Configuration* screen select the *Volume* option. The *Volume Configuration* dialog will be displayed.
- In the *Pulse Outputs* section select the appropriate (*Corrected* or *Uncorrected*) drop down selection box and select the desired option. The new value will be highlighted yellow.
- Select the *OK* option within the *Volume Configuration* dialog.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

To set the pulse width:

- In the *Configuration* screen select the *Volume* option, the *Volume Configuration* dialog will be displayed.
- In the *Pulse Outputs* section select the *Pulse Width* drop down selection box and select the desired option. The new value will be highlighted yellow.
- Select the *OK* option within the *Volume Configuration* dialog.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

6.3.4 Meter Data

The *Meter Data* section on the *Volume Configuration* dialog contains 3 editable fields; 2 drop down selection boxes labeled *Type* and *Size*, a text box labeled *Meter/Site ID*.

The number of revolutions per ft^3 (rev/ft^3) / m^3 (rev/m^3) (dependent on meter type selected) is automatically displayed when the appropriate meter *Type* and *Size* are selected from the appropriate drop down selection boxes, these details should reflect the meter type and size that the IMC/W2 is fitted to.

If the meter configuration required is not shown in the drop down selection boxes, the *Manual* option from within the *Size* drop down selection box should be selected. Note: If cubic feet (cu ft) is required ensure that an imperial meter type is selected within the *Type* drop down selection box (e.g. *Series B*); if m^3 is required a metric meter type should be selected (e.g. *Series B Metric*).

If the *Manual* option is selected within the *Size* drop down selection box the text below will be enabled, this will allow the operator to enter the desired number of revolutions per $\text{cu ft} / \text{m}^3$.

To set the meter type:

- In the *Configuration* screen select the *Volume* option. The *Volume Configuration* dialog will be displayed.
- In the *Meter Data* section select the *Type* drop down selection box and select the desired option. The new value will be highlighted yellow.
- Select the *OK* option within the *Volume Configuration* dialog.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

To set the meter size:

- In the *Configuration* screen select the *Volume* option. The *Volume Configuration* dialog will be displayed.
- In the *Meter Data* section select the *Size* drop down selection box and select the desired option. The new value will be highlighted yellow.
- Select the *OK* option within the *Volume Configuration* dialog.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

To set the meter / site ID:

- In the *Configuration* screen select the *Volume* option. The *Volume Configuration* dialog will be displayed.
- In the *Meter Data* section select the *Meter/Site ID* text box and enter the desired meter / site ID reference. The new value will be highlighted yellow.
- Select the *OK* option within the *Volume Configuration* dialog.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

6.3.5 Display

The LCD is capable of displaying up to 8 digits for the various volumes, with a maximum volumes value equal to 99999999. On receipt of the next input pulse the LCD will display 00000000; if the configuration data within the IMC/W2 is then uploaded to the MCUT, the appropriate volume register will display 100000000 - the volume registers within the IMC/W2 are capable of storing up to 9 digits. The MCUT will also display up to 9 digits; therefore the maximum volumes value is equal to 999999999. On receipt of the next input pulse the volume register will be equal to 000000000.

It is possible to independently configure the corrected and uncorrected volumes on the LCD; both the multipliers and number of digits displayed on the LCD (between 5 and 8) can be changed. An increase to the *Multiplier* will effectively shift the appropriate volume value to the left on the LCD, revealing the most significant figure of the volumes value; if no further significant values are to be revealed a 0 is placed in front of the volumes value. A decrease to the *Digits* will effectively 'remove' the most significant figure of the volumes value. The affect of the various *Multiplier* and *Digits* options is detailed in table 3 (*Volume Multiplier and Digits Reference Table*), in addition a sample corrected and uncorrected volume value is displayed within the *Display* section on the *Volume Configuration* dialog.

Table 3 – Volume Multiplier and Digits Reference Table

Volume Reading	Multiplier Option	Digits Option	Volume Displayed on LCD
123456789	x0.1	8	34567890
	x1		23456789
	x10		12345678
	x100		01234567
	x1000		00123456
123456789	x0.1	7*	4567890
	x1		3456789
	x10		2345678
	x100		1234567
	x1000		0123456
123456789	x0.1	6*	567890
	x1		456789
	x10		345678
	x100		234567
	x1000		123456
123456789	x0.1	5*	67890
	x1		56789
	x10		45678
	x100		34567
	x1000		23456
* When selected the <i>Display U / C on LCD</i> check box is displayed, by selecting this option a <i>U</i> will be displayed on the uncorrected volume and a <i>C</i> on the corrected volume on the LCD.			

The Display section on the Volume Configuration dialog contains 4 drop down selection boxes; Corrected Volume Multiplier, Corrected Volume Digits, Uncorrected Volume Multiplier and Uncorrected Volume Digits.

To set the corrected and uncorrected volume multiplier:

- In the *Configuration* screen select the *Volume* option. The *Volume Configuration* dialog will be displayed.
- In the *Display* section, select the appropriate *Multiplier* drop down selection box and select the desired option. The new value will be highlighted yellow.
- Select the *OK* option within the *Volume Configuration* dialog.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

To set the corrected and uncorrected volume digits:

- In the *Configuration* screen select the *Volume* option. The *Volume Configuration* dialog will be displayed.
- In the *Display* section select the appropriate *Digits* drop down selection box and select the desired option. The new value will be highlighted yellow.
- Select the *OK* option within the *Volume Configuration* dialog.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

6.3.6 Pulse Output Allocation

- In the *Configuration* screen select the *Pulse Output 1 or 2 or3* option. The required *Pulse Output Allocation Configuration* dialog will be displayed.
- In the *Pulse Output Allocation* section select the required *Pulse Output* drop down selection box and select the desired option i.e. *Uncorrected, Corrected* or *Fault*. The new value will be highlighted yellow.
- Select the *OK* option within the *Volume Configuration* dialog.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. On completion a dialog will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

6.4 Corrections Configuration

To display the *Corrections Configuration* dialog select the *Corrections* option in the *Configuration* screen. Table 4 ([Correction Configuration Parameter Reference Table](#)) is provided as a quick reference indicating the accepted ranges for the correction configuration parameters.

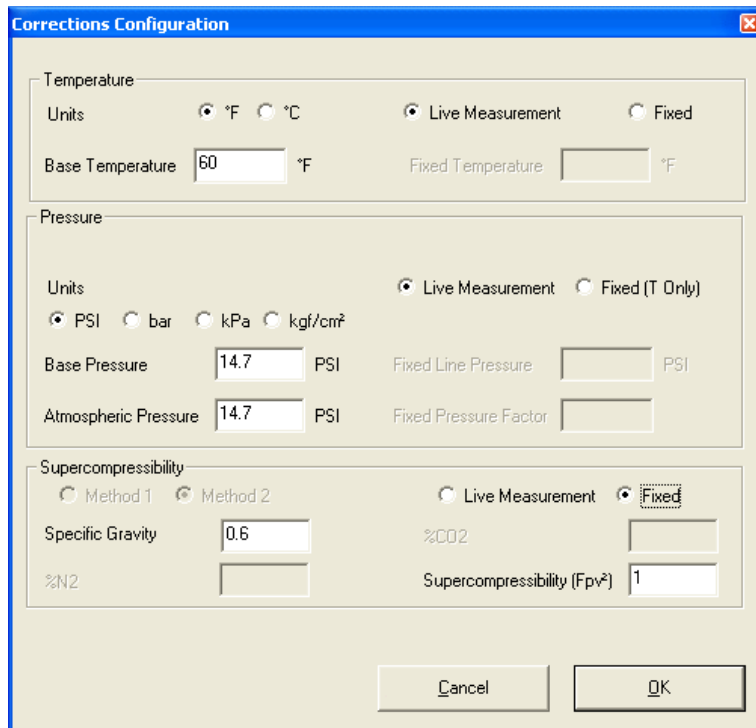


Figure 5 - Corrections Configuration Screen

The *Corrections Configuration* screen is divided 3 sections and the parameters that can be changed within this dialog are those associated with volume correction:

- Temperature – the operator is able to specify the temperature units, base temperature value, and whether to utilize either live temperature measurement via the temperature probe or a specified fixed temperature value.
- For temperature probe installation instructions please refer to the *Integral Micro Series Volume Corrector, Model IMC/W2 manual (PH028)*.
- Pressure – the operator is able to specify the pressure units, base pressure value, and whether to utilize either live pressure measurement via the pressure transducer or values for specified fixed line pressure and fixed pressure factor values. If the fixed line pressure value option is selected, it is also necessary to specify whether the value is absolute or gauge (in the case of gauge, an atmospheric pressure value will need to be entered). For pressure transducer installation instructions please refer to the *Integral Micro Series Volume Corrector, Model IMC/W2 manual (PH028)*.
- Supercompressibility – the operator is able to specify whether a fixed Supercompressibility value is to be utilized or calculated using gas constituent values supplied by the operator. Previously, if fixed factor supercompressibility was selected, the specific gravity value was not accessible. This is now configurable for DP-versions.

Table 4 – Correction Configuration Parameter Reference Table

Parameter	Minimum	Maximum	Minimum	Maximum
Base Temperature	32 °F	86 °F	0 °C	30 °C
Fixed Temperature	-40 °F	140 °F	40 °C	60 °C
Base Pressure	9 PSI	15 PSI	0.621 bar	1.034 bar
	-	-	62.052 kPa	103.420 kPa
	-	-	0.63293 kgf/cm ²	1.05488 kgf/cm ²
Atmospheric Pressure	8 PSI	15 PSI	0.552 bar	1.034 bar
			55.157 kPa	103.420 kPa
			0.56260 kgf/cm ²	1.05489 kgf/cm ²
Fixed Line Pressure*	See note below			
Fixed Pressure Factor*	See note below			
Heating Value	509.9 BTU/ft ³	1288.3 BTU/ft ³	19.0 MJ/m ³	48.0 MJ/m ³
Supercompressibility (Fpv ²)	0.9	1.2	-	-
Specific Gravity	0.5	0.9	-	-
% CO2	0.0	30.0	-	-
% N2	0.0	50.0	-	-
* The acceptable ranges for <i>Fixed Line Pressure</i> and <i>Fixed Pressure Factor</i> are variable and depend on the pressure transducer reference type.				

6.4.1 Temperature Measurement

- Live temperature measurement is performed by a 4-wire Class A 100 ohm platinum resistance thermometer (supplied as an option with the IMC/W2), for further details refer to the *Integral Micro Series Volume Corrector, Model IMC/W2 manual (PH028)*, or contact your Dresser Representative for further details. Alternatively, if live temperature readings cannot be taken, the operator is able to specify a fixed temperature; this constant value is then used for calculating supercompressibility.

It is possible to set the temperature units to enable the display of temperature readings in either °C or °F.

To set the temperature units:

- In the *Configuration* screen select the *Corrections* option. The *Corrections Configuration* screen will be displayed.
- In the *Temperature* section select the desired *Units* option (°C or °F). The option described as the *Base Temperature* value will be highlighted yellow, and the new temperature units will be displayed to the right of the *Base Temperature* text box.
- Select the *OK* option within the *Corrections Configuration* screen.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

To set the base temperature:

- In the *Configuration* screen select the *Corrections* option. The *Corrections Configuration* dialog will be displayed.
- In the *Temperature* section select the *Base Temperature* text box and enter the desired value. The new value will be highlighted yellow.
- Note: See Table 5 (*Correction Configuration Parameter Reference Table*) for acceptable range.
- Select the *OK* option within the *Corrections Configuration* screen.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

To set a fixed temperature value:

- In the *Configuration* screen select the *Corrections* option, the *Corrections Configuration* screen will be displayed.
- In the *Temperature* section select the *Fixed* option. The new option described as the *Fixed Temperature* text box will be enabled.
- Select the *Fixed Temperature* text box and enter the desired value. The new value will be highlighted yellow.
- Note: See Table 5 (*Correction Configuration Parameter Reference Table*) for acceptable range.
- Select the *OK* option within the *Corrections Configuration* screen.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

Note: When a fixed temperature value is used the temperature alarm limits and settings (accessible through the *Faults & Alarms* screen) are disabled.

To use live temperature measurement:

- In the *Configuration* screen select the *Corrections* option. The *Corrections Configuration* screen will be displayed.
- In the *Temperature* section select the *Live Measurement* option. The option displayed as the *Fixed Temperature* text box will be disabled.
- Select the *OK* option within the *Corrections Configuration* screen.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

6.4.2 Pressure Measurement

Live pressure measurement (where fitted) is conducted via a factory installed pressure transducer (pressure transducer range is order specific). For further details regarding the pressure transducer and alternative ranges refer to the *Integral Micro Series Volume Corrector, Model IMC/W2 manual (PH028)*, or contact your Dresser Representative for further details. If a gauge transducer is fitted, an additional text box is enabled to allow the operator to specify the appropriate value for *Atmospheric Pressure*. Alternatively, if live pressure readings cannot be taken, the operator is able to specify a fixed line pressure value; this constant value is then used for calculating supercompressibility.

It is possible to set the pressure units to display of pressure readings in bar, kgf/cm², kPa or PSI.

To set the pressure units:

- In the *Configuration* screen select the *Corrections* option. The *Corrections Configuration* screen will be displayed.
- From within the *Pressure* section select the desired *Units* option (bar, kgf/cm², kPa or PSI). The new option described as the *Base Pressure* value will be highlighted yellow, and the new pressure units will be displayed to the right of the *Base Pressure* text box.
- Select the *OK* option within the *Corrections Configuration* screen.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

To set the base pressure:

- In the *Configuration* screen select the *Corrections* option. The *Corrections Configuration* screen will be displayed.
 - In the *Pressure* section select the *Base Pressure* text box and enter the desired value. The new value will be highlighted yellow.
 - Note: See Table 4 ([Correction Configuration Parameter Reference Table](#)) for acceptable range.
 - Select the *OK* option on the *Corrections Configuration* screen.
 - The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow in the parameters selection list.
 - Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

To set a fixed line pressure value:

- The value entered for the *Fixed Line Pressure* determines the value for the *Fixed Pressure Factor* and vice versa; these values are automatically updated when either of the two parameters is changed.
- On the *Configuration* screen, select the *Corrections* option. The *Corrections Configuration* screen will be displayed.
- In the *Temperature* section select the *Fixed (T Only)* option. The new option described as the pressure reference (*Absolute* and *Gauge*) options will be enabled.
- Select the appropriate pressure reference option.
- Note: If the *Gauge* option is selected an additional text box labeled *Atmospheric Pressure* will be enabled, and the appropriate value should be entered. See Table 4 ([Correction Configuration Parameter Reference Table](#)) for acceptable range.
- Select the *Fixed Line Pressure* text box and enter the desired value. The new value will be highlighted yellow.
- Note: The acceptable *Fixed Line Pressure* range will depend on other parameter settings; if an invalid value is entered the operator will be advised of the acceptable range.
- Select the *OK* option within the *Corrections Configuration* screen.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow in the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

Note: When a fixed temperature value is used the temperature alarm limits and settings (accessible through the *Faults & Alarms* screen) are disabled.

To set a fixed pressure factor value:

- The value entered for the *Fixed Pressure Factor* determines the value for the *Fixed Line Pressure* and vice versa; these values are automatically updated when either of the two parameters is changed.
- In the *Configuration* screen select the *Corrections* option, and the *Corrections Configuration* screen will be displayed.
- In the *Temperature* section select the *Fixed (T Only)* option. The new option described as the pressure reference (*Absolute* and *Gauge*) options will be enabled.
- Select the appropriate pressure reference option.
- Note: If the *Gauge* option is selected an addition text box labeled *Atmospheric Pressure* will be enabled the appropriate value should be entered. See Table [4 \(Correction Configuration Parameter Reference Table\)](#) for acceptable range.
- Select the *Fixed Pressure Factor* text box and enter the desired value. The new value will be highlighted yellow.
- Note: The accepted *Fixed Pressure Factor* range will depend on other parameter settings; if an invalid value is entered the operator will be advised of the acceptable range.
- Select the *OK* option within the *Corrections Configuration* screen.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow in the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

Note: When a fixed temperature value is used the temperature alarm limits and settings (accessible through the *Faults & Alarms* screen) are disabled.

To utilize live pressure measurement:

- In the *Configuration* screen select the *Corrections* option. The *Corrections Configuration* screen will be displayed.
- In the *Pressure* section select the *Live Measurement* option. The options described as the *Fixed Line Pressure* and *Fixed Pressure Factor* text boxes will be disabled.
- Select the *OK* option in the *Corrections Configuration* screen.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow in the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

(See Section 12 for Monitor Pressure)

6.4.3 Supercompressibility

Volume correction is calculated on the basis of live pressure and temperature measurement, fixed pressure and temperature measurement or any combination of fixed and / or live pressure and / or temperature measurement. Where volume correction is not fitted the supercompressibility value is static, but can be changed within the MCUT by the operator.

The operator is able to specify whether supercompressibility is to be calculated using gas constituents selected by the operator and from the live pressure and temperature readings, or if a fixed “Z” value is to be used with the pressure and temperature. The gas compressibility calculations depend on the composition of the gas; this information is entered when utilizing the *Live Measurement* method. There are two methods available for calculating the live supercompressibility; *Method 1* and *Method 2*. The *Method 1* option allows the value of supercompressibility to be calculated from the gas relative density (specific gravity), Heating Value and % CO₂. The *Method 2* option allows the value of supercompressibility to be calculated from the gas relative density (specific gravity), %N₂ and % CO₂.

The measured volume at line conditions is corrected to the volume at base conditions using the following formula:

$$V_n = V \times (P/P_n) \times (T_n/T) \times (Z_n/Z)$$

Where:

V is the metered volume
P is the absolute pressure* at line conditions.
T is the absolute temperature (Rankine or Kelvin)
Z is the compressibility

*For gauge transducers, P is determined by P_g + P_a, where P_g is the pressure from the gauge transducer and P_a is the entered atmospheric pressure value.

V_n is the volume
P_n is the absolute pressure at base (or reference) conditions.
T_n is the absolute temperature (Rankine or Kelvin)
Z_n is the compressibility

Calculation accuracy is typically better than 0.01%.

To set a fixed supercompressibility value:

- In the *Configuration* screen select the *Corrections* option and the *Corrections Configuration* screen will be displayed.
- In the *Supercompressibility* section select the *Fixed* option. The new option described as the *Supercompressibility (Fpv²)* text boxed will be enabled.
- Select the *Supercompressibility (Fpv²)* text box and enter the desired value. The new value will be highlighted yellow.
- Note: See table 4 (*Correction Configuration Parameter Reference Table*) for acceptable range.
- Select the *OK* option on the *Corrections Configuration* screen.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

To utilize Method 1 for Live Measurement:

- On the *Configuration* screen select the *Corrections* option and the *Corrections Configuration* screen will be displayed.
- In the *Supercompressibility* section select the *Live Measurement* option. The *Method 1* and *Method 2* options will be enabled.
- Select the *Method 1* option. The *Heating Value* text box will be displayed.
- Select the *Specific Gravity* text box and enter the desired value. The new value will be highlighted yellow.
- Note: See [table 4 \(Correction Configuration Parameter Reference Table\)](#) for acceptable range.
- In the *Supercompressibility* section, select the desired *Heating Value Units* option (BTU/ft³ or MJ/m³). The *Heating Value* selection will be highlighted yellow.
- Note: See Table 4 (*Correction Configuration Parameter Reference Table*) for acceptable range.
- Select the *% CO2* text box and enter the desired value. The new value will be highlighted yellow.
- Note: See Table 4 (*Correction Configuration Parameter Reference Table*) for acceptable range.
- Select the *OK* option on the *Corrections Configuration* screen.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow on the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. On completion a dialog will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

To utilize Method 2 for Live Measurement:

- On the *Configuration* screen select the *Corrections* option and the *Corrections Configuration* screen will be displayed.
- In the *Supercompressibility* section, select the *Live Measurement* option. The *Method 1* and *Method 2* options will be enabled.
- Select the *Specific Gravity* text box and enter the desired value. The new value will be highlighted yellow.
- Note: See Table 4 (*Correction Configuration Parameter Reference Table*) for acceptable range.
- Select the *% N2* text box and enter the desired value. The new value will be highlighted yellow.
- Note: See Table 4 (*Correction Configuration Parameter Reference Table*) for acceptable range.
- Select the *% CO2* text box and enter the desired value. The new value will be highlighted yellow.
- Note: See Table 4 (*Correction Configuration Parameter Reference Table*) for acceptable range.
- Select the *OK* option in the *Corrections Configuration* screen.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow on the parameters selection list.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. On completion a dialog will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

6.4.4 Differential Pressure Monitoring

Meter differential pressure (DP) diagnostic functionality for ROOTS[®] gas meters is possible for meters equipped with a Dresser IMC/W2-dp. Meter diagnostics are based on the DP value measured between inlet and outlet meter pressure test connections (per ANSI B109.3 Appendix A). The differential pressure value is measured every 30 seconds and is displayed on the IMC/W2-dp's LCD. This value is accessible through the MCUT and is visible on the Live Data screen.

Measured DP value is used to determine:

- Average DP and related values when stable conditions provide a valid test
- Gas meter alarm conditions
- Gas meter fault conditions

The following 3 conditions are monitored and signalled by IMC/W2-dp diagnostics:

- Meter DP Alarm
- Meter DP Fault
- Meter Lock-up Fault

Meter DP Alarm

The meter DP alarm is activated if the number of measured high occurrences exceeds the meter DP alarm threshold (calculated by the learned model). The meter DP alarm is only enabled for flow rates higher than the required DP minimum flow rate. Pulse outputs may be generated if this option is selected on the *Alarm Settings* screen (See Section 9.5 *Alarm Settings*).

Meter DP Fault

The meter DP fault is activated if the number of measured high occurrences exceeds the meter DP fault threshold (calculated by learned model). The meter DP fault is only evaluated for flow rates higher than the required DP minimum flow rate. If this fault occurs, then “dP FLt” is shown on the LCD and fault output pulses are generated.

Meter Lock-up Fault

The meter lock-up fault is activated if the number of measured high occurrences exceeds the meter lock-up threshold. The lock-up threshold is defined as the theoretical DP value for particular conditions multiplied by the lock-up factor, provided there is a sufficient period of stable flow. If this fault occurs, then “dP LOC” is shown on the LCD and fault output pulses are generated.

The following parameters are required for DP measurement:

- Gas flow rate
- Line gas pressure
- Gas temperature
- Gas composition
- Gas meter size/type

Differential pressure is calculated using mathematical models, which are based on the above indicated parameters. The measured differential pressure is compared with the theoretical value calculated from the mathematical model. Flow rate, line pressure, and line temperature are all measured by the Micro Corrector and entered into the analytical model. Gas composition and meter size/type must be entered by the operator using the MCUT software. (See Section 10.7.2 *DP Measurement Setup* for mathematical model configuration.)

6.5 Set Date & Time

It is possible to set the date and time stored in the IMC/W2 using the MCUT software. This may be required if the unit has been left in storage for a period of time without the battery connected. It is also possible to set Date Format.

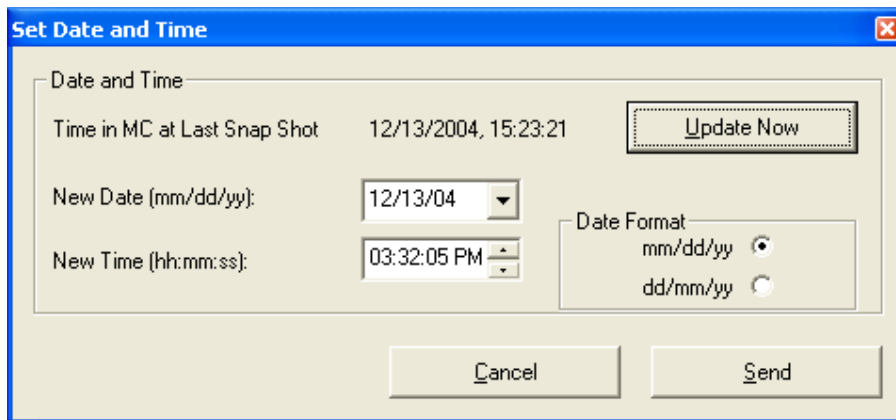


Figure 6 - Set Date and Time Screen

To set the date and time:

- On the *Configuration* screen select the *Set Date & Time* option and the *Set Date and Time* screen will be displayed.
- The date and time stored in the IMC/W2 is displayed and is identified as *Time in MC at Last Snap Shot*.
- Select the *Update Now* option; the *Time in MC at Last Snap Shot* value, *New Date (mm/dd/yy)** and *New Time (hh:mm:ss)* selection boxes will all be updated.
- If an update to the date is required select the *New Date (mm/dd/yy)* drop down selection box. A calendar dialog will be displayed. Select the appropriate date. To change the month displayed select the appropriate

arrow option located at the top of the calendar dialog. Once a date has been selected the dialog will close and the new date will be displayed in the drop down selection box.

- If an update to the time is required select the *New Time (hh:mm:ss)* box. Each time unit (hours / minutes / seconds) is changed individually, by highlighting the relevant section then selecting either the up or down arrow located at the right hand side of the selection box. Alternatively, the new setting for each section may be entered via the keyboard.
- Select the *Send* option to upload the new date and time to the IMC/W2.
- If the unit has not made any data log entries the new date and time will be uploaded. If data log entries exist the operator will be advised to download the data logs prior to updating the date and time.

Note: All data logs will be cleared when the date and / or time are updated to the IMC/W2. It is therefore recommended that all data logs are downloaded from the IMC/W2 before the new data and / or time settings are uploaded. For information regarding the download of data logs refer to section [11.2 \(Download Data Log\)](#).

*The MCUT will display the date format in the same format as configured within the PC it is operating, for example if the default PC setting is DD/MM/YY the MCUT will display the date format in DD/MM/YY. The LCD will always display the date format in MM/DD/YY.

6.6 Customize LCD

Depending on the particular model options chosen the front panel selector button of the IMC/W2 will enable the following parameters to be displayed on the LCD:

- *Corrected Volume.*
- *Uncorrected Volume.*
- *Flow Rate.*
- *Correction Factor.*
- *Meter Size.***
- *Line Pressure.*
- *Temperature.*
- *Uncorrected Volume Under Fault.*
- *Corrected Residual.*
- *Uncorrected Residual.*
- *Firmware version.*
- *Atmospheric Pressure.**
- *Base Pressure.*
- *Pressure Factor.*
- *Supercompressibility.*
- *Battery Voltage.*
- *Current Date.*
- *Current Time.*
- *Configurable Screens* – Three additional parameters connected with Daily Consumption could be selected from seven options:
 - *Accumulated Corrected Volume previous day,*
 - *Accumulated Corrected Volume current day,*
 - *Accumulated Corrected Volume previous month,*
 - *Accumulated Corrected Volume current month,*
 - *Highest daily volume in the previous month,*
 - *Highest daily volume in the current month,*
 - *Date of last consumption alarm,*
 - *Maximum peak flow,*
 - *Differential pressure results***.*
- *(Test Screen).*

*Only where applicable, i.e. if transducer fitted is gauge – Figure 7 (*Customize LCD Dialog*) below represents an IMC/W2 with an absolute transducer.

**Monitor Pressure is available instead of Meter Size if corrector is equipped with second external pressure transducer / Differential pressure is available instead of Meter Size if corrector is equipped with DP transducers.

***Only available for IMC/W2-dp.

It is possible to *switch* the displayed parameters *on* and *off*, in addition the operator is able to specify which parameter should be displayed as the default parameter displayed on the LCD. At least one of the first 7 (*Main Screen*) parameters must be *switched on*.

By default, all available parameters (dependent on model chosen at time of order) will be displayed. The *switched on* parameter check boxes have a check placed in the associated check box indicating that the parameter is to be displayed on the LCD.

To set the default screen parameter on the LCD:

- On the *Configuration* screen select the *Customize LCD* option and the *Customize LCD* screen will be displayed.
- Select the desired *Default Screen* option. If the parameter was previously *switched off*, selection of that parameter as the *Default Screen* will cause the parameter to be *switched on*.
- Select the *OK* option within the *Customize LCD* dialog.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*.

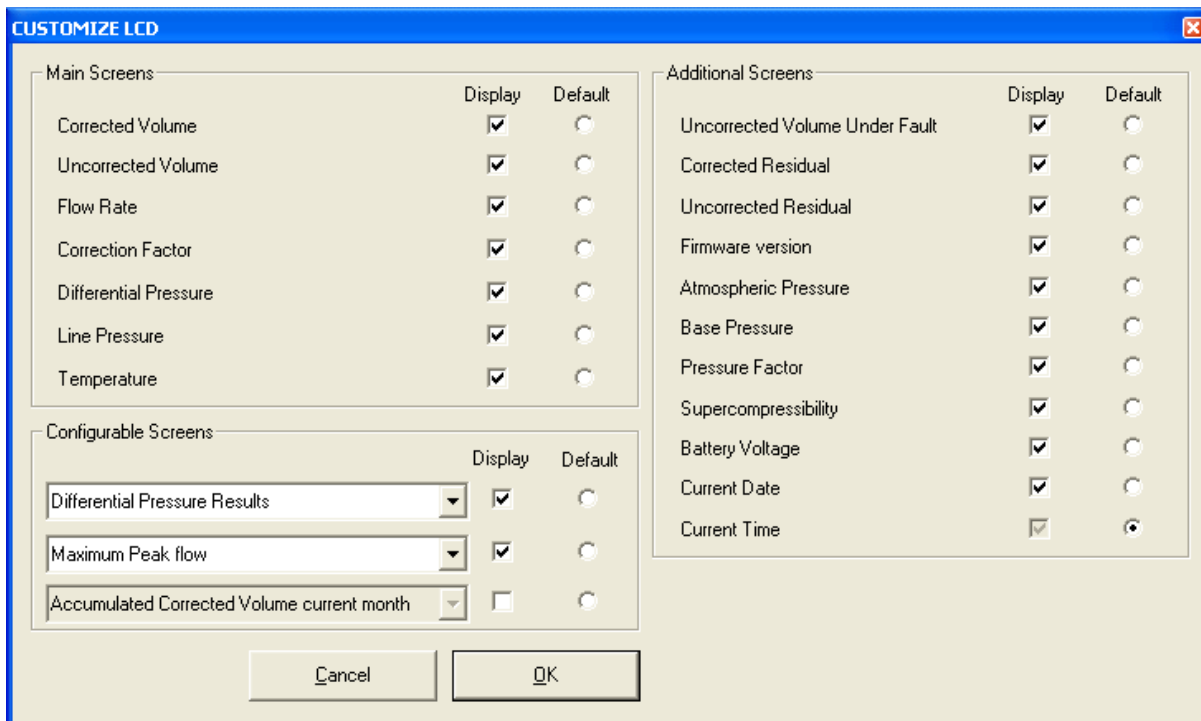


Figure 7 - Customize LCD Screen

To switch off parameters on the LCD:

- On the *Configuration* screen select the *Customize LCD* option and the *Customize LCD* dialog will be displayed.
- Select the parameter(s) that is / are not required to be displayed on the LCD - refer to the check box. Ensure that parameters that are set to be *switched off* of the LCD (not displayed) are disabled.
- Note: It is not possible switch the default screen parameter off. If this screen is not required to be displayed on the LCD the *Default Screen* option must be set to a parameter that is required to be displayed on the LCD.
- Select the *OK* option in the *Customize LCD* dialog.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow within the parameters selection list.
- Select *Upload to MC*. The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*.

To switch on parameters on the LCD:

- On the *Configuration* screen select the *Customize LCD* option and the *Customize LCD* screen will be displayed.
- Select the parameter(s) that is / are required to be displayed on the LCD, ensure that a check is displayed in the appropriate check box. If a parameter is disabled it may be because it is not available on the IMC/W2 that you have (dependent on model chosen at time of order). For further details contact your Dresser Representative.
- Select the *OK* option on the *Customize LCD* screen.
- The *Configuration* screen will be displayed and any changed parameters will be highlighted yellow on the parameters selection list.
- Select *Upload to MC*. The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*.

6.7 MC Comms Settings

Selection between Modem/Printer should normally be set to Modem.

Line and GSM modems can be used with IMC/W2 corrector to utilize remote communication. The Dresser *Micro Modem* is a line type modem. There is also an option for a Dresser *Micro Modem*, model GSM/GPRS.

- From within the *Configuration* screen select the *MC Comms Settings* option. The *MC Comms Settings* screen will be displayed.

Note: MC Comms Setting has to be selected and saved using direct communication. There is no access to this setup if MCUT is set for remote communication.

6.7.1 Call Monitor Setup

NOTE: The call monitor option is only available for IMC/W2 firmware versions 1.91 or older.

To specify the modem type:

- Select the *Modem Type* option i.e. Line or GSM.

Line Type Modem

The baud rate of the modem has to be selected (see Figure 8). Please refer to your modem manual for the baud rate details. For further details please consult your Dresser Representative. Dresser *Model 108 Micro Modem* requires 2400 baud rate speed selection.

Note: The PC modem has to be configured with this same baud rate; otherwise the remote communication process will not be successful. Look at chapter 6.10 for details.

To specify the line modem baud rate (Figure 8):

- Select the *Baud Rate* drop down selection box and select the appropriate baud rate.
- Select the *OK* option. The *Configuration* screen will be displayed

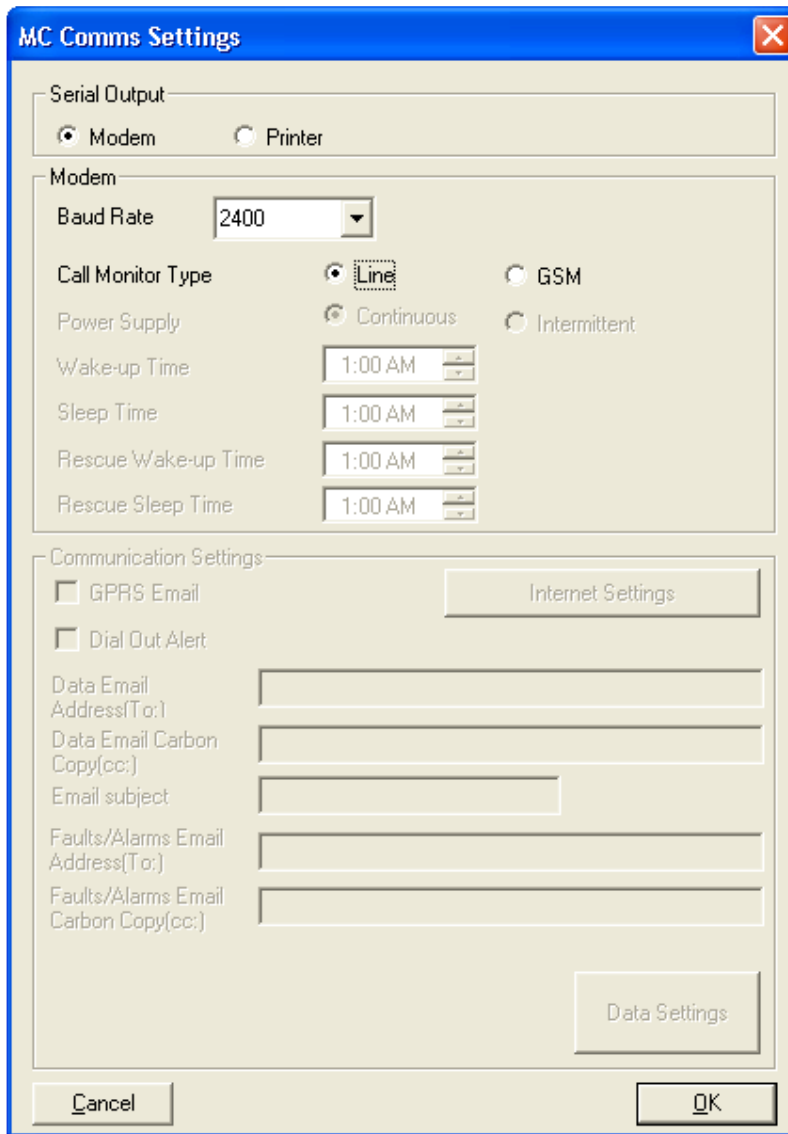


Figure 8 – MC Comms Settings Screen (Line Modem)

GSM Type Modem

The baud rate of the GSM modem has to be selected (Figure 9). Maximum baud rate speed of the GSM modem is 9600, however lower baud rates can also be selected.

Note: The PC modem has to be configured with this same baud rate; otherwise, the remote communication process will not be successful. Look at chapter 6.10 for details.

To specify the GSM modem baud rate:

- Select the *Baud Rate* drop down selection box and select the appropriate baud rate.
- Select the *OK* option. The *Configuration* screen will be displayed.

Selection of GSM type modem allows also to select modem *Power Supply* mode. If *Continuous* is selected then the GSM modem is constantly operational and communication can be made at any time (Figure 9). If *Intermittent* is selected then GSM modem is operational only during two selectable time periods (Figure 10). The first period starts at *Wake-up Time* and finishes at *Sleep Time*. The second period starts at *Rescue Wake-up Time* and finishes at *Rescue Sleep Time*. *Power Supply* mode and these four *Times* are selected on the *MC Comms Settings* dialog screen. *Intermittent Power Supply* mode is selected to conserve power taken from the modem power supply source, such as a solar panel.

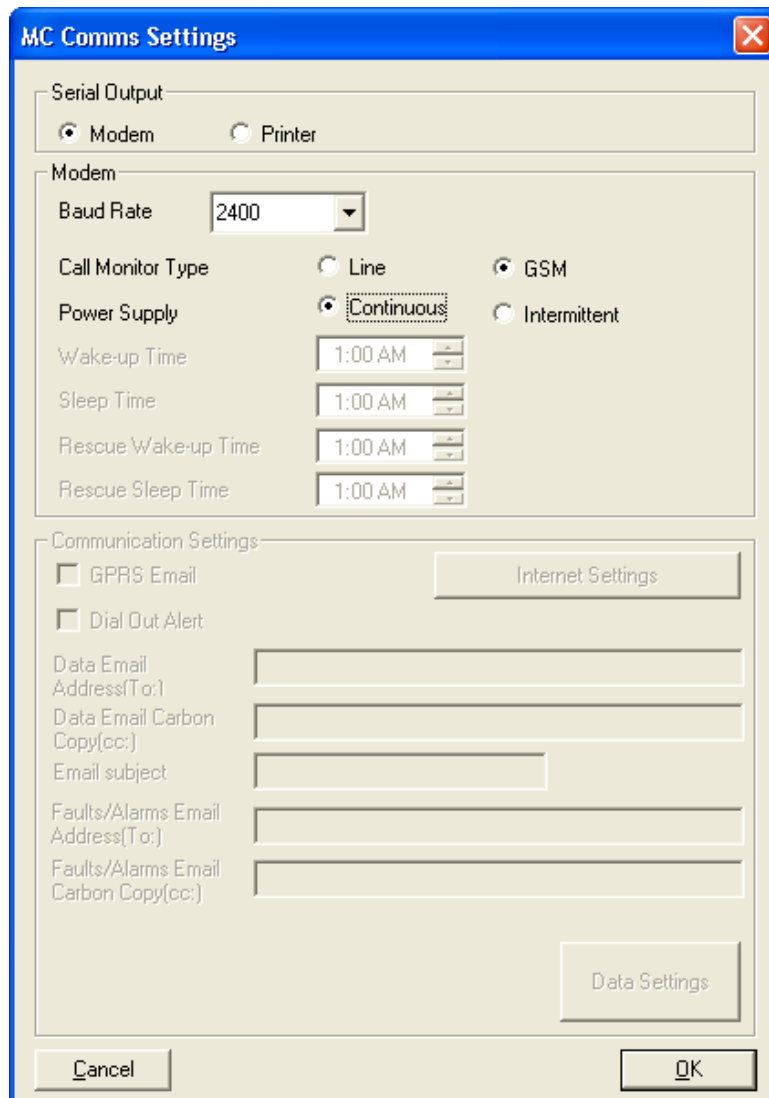


Figure 9 – MC Comms Settings Screen (GSM Modem – Continuous Power)

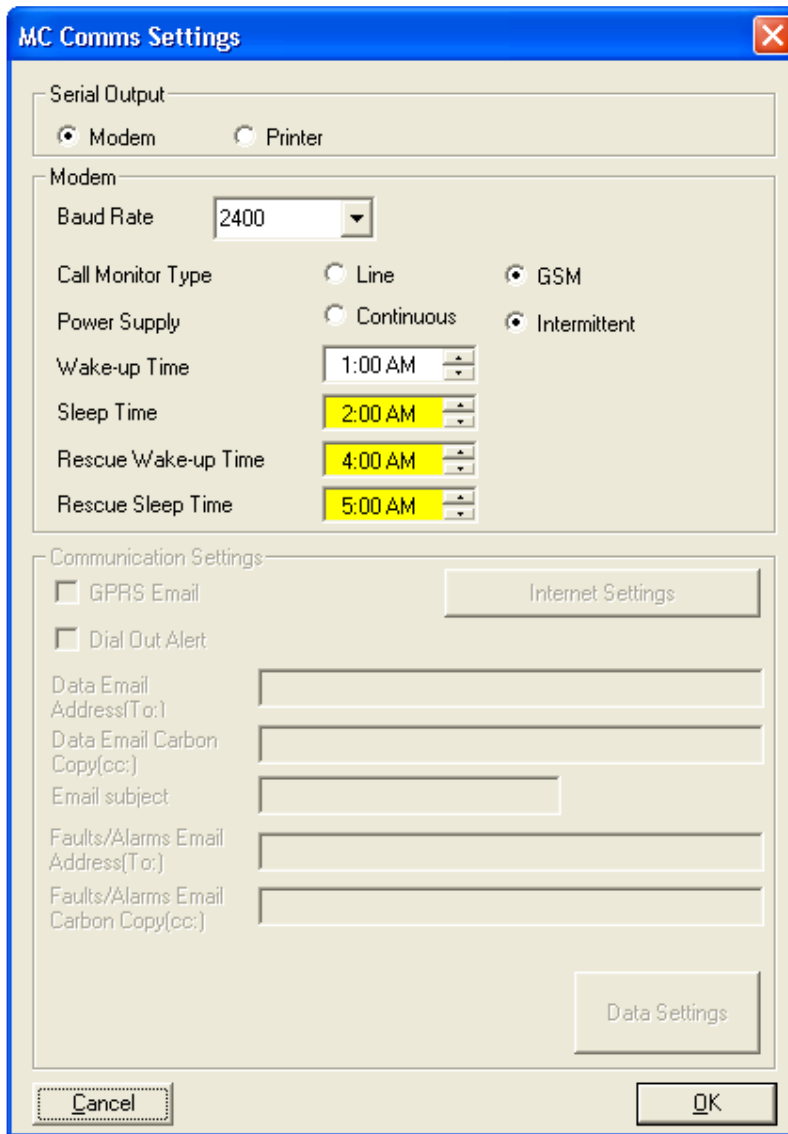


Figure 10 – MC Comms Settings Screen (GSM Modem – Intermittent Power)

6.7.2 Email Setup

Note: The *Email* option is only available for IMC/W2 firmware versions 1.93 or newer.

GPRS (General Packet Radio Service) provides the capability of e-mailing data from the corrector. The GPRS modem unit should be fitted with a SIM (Subscriber Identity Module).

The current baud rate of the GSM/GPRS Modem is fixed at 2400, so the corrector should be set to that rate. If *Power Supply* is set to *Continuous*, the corrector is accessible for remote connection (Dial up) via MCUT using option 'connect using a modem' at any time. If it is set to *Intermittent*, the unit will 'wake' and 'sleep' according to the times set. Dial up communication using the MCUT can be done only during the wake-up time slot. Regardless of what wake-up and sleep times have been set for intermittent use, the unit will still wake for sending e-mail.

- On the MC Comms Settings screen, check the *Email* box and the 'Email' data fields become active. One email address data field must be set to the email account set up specifically for use with the MCNet translation software. The email address must be capable of handling 'POP3' email format. MCNet software translates the email content into a tabulated form similar to that obtained by direct connection request using the MCUT. The other email data field can optionally be set to any destination of the customer's choosing, but it is not obligatory. Any completed data fields must contain the full email address. Text entered as the *Email subject* will appear in the recipient's email along with the content information, e.g. Data Log 1 or Alarm, etc.

The screenshot shows the 'MC Comms Settings' dialog box. It is divided into several sections:

- Serial Output:** Radio buttons for 'Modem' (selected) and 'Printer'.
- Modem:** A dropdown menu for 'Baud Rate' set to '2400'. Radio buttons for 'Call Monitor Type' with 'Line' and 'GSM' (selected).
- Power Supply:** Radio buttons for 'Continuous' (selected) and 'Intermittent'.
- Timing:** Five time selection fields: 'Wake-up Time', 'Sleep Time', 'Rescue/Wake-up Time', and 'Rescue Sleep Time', all set to '12:00 AM'.
- Communication Settings:** A checked checkbox for 'Email' and an unchecked checkbox for 'Dial Out Alert'. A button labeled 'Internet Settings' is to the right.
- Email Fields:** Several text input fields, all containing 'data@example.com':
 - Data Email Address(To:)
 - Data Email Carbon Copy(cc:)
 - Email subject (containing 'Test Results')
 - Faults/Alarms Email Address(To:)
 - Faults/Alarms Email Carbon Copy(cc:)
- Buttons:** 'Cancel' and 'OK' at the bottom. A 'Data Settings' button is located at the bottom right of the main settings area.

Figure 11 – MC Comms Settings Screen (Email – Continuous Power)

Note: An additional power savings option is available when *Intermittent* is selected. If all 4 times are set equal to each other (See Figure 12), the modem will only wake-up for email transfer if any of the configured faults or alarms have occurred, otherwise the modem will remain in standby mode.

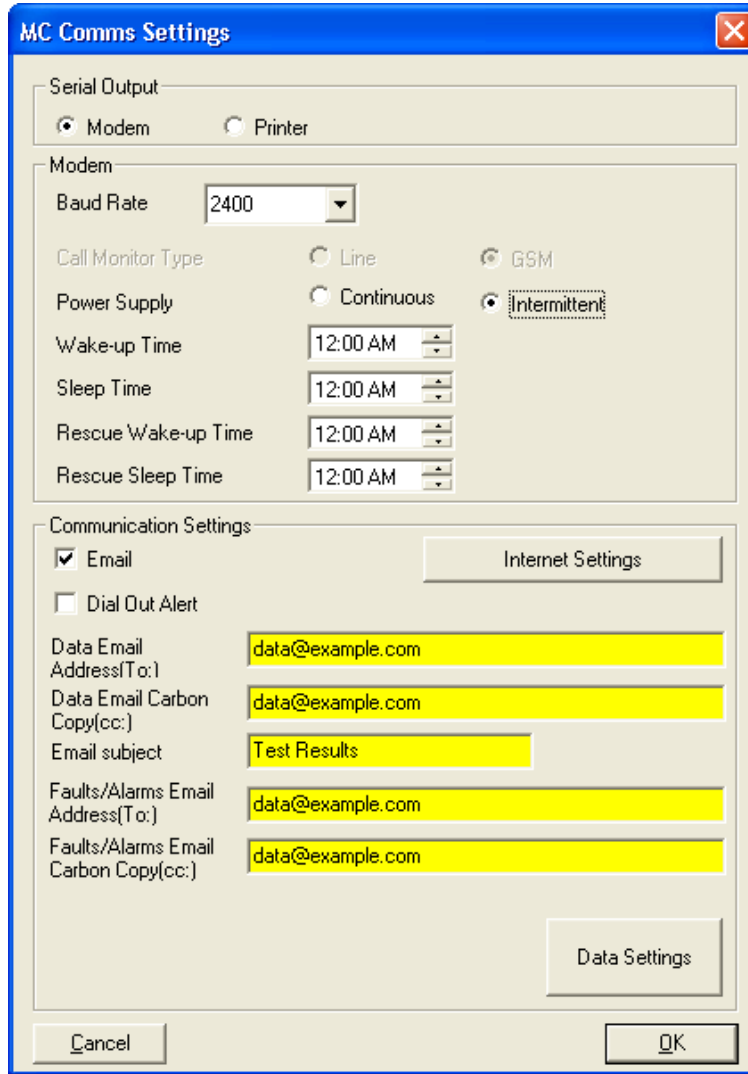


Figure 12 – MC Comms Settings Screen (Email – Intermittent Power)

- After selecting the *Email* check box, the 'Internet Settings' button will become active. Select the 'Internet Settings' button and the screen in Figure 13 appears, containing default information.

Figure 13 – Internet Settings Screen

- **Modem Model** – Select between eDSoft and WIPSoft wireless protocols (Firmware 1.93 or newer is required for communication with WIPSoft modems).
- **APN Settings** - APN, or Access Point Name, relates to the SIM provider. The *User & Password* are customer specific as issued by the provider. When the customer purchases their 'Data only' SIM, they will need to obtain this information from their provider. For example, the UK network company **O2** has the following for its SIM cards:

Server - Mobile.o2.co.uk
User - web
Password - password

- Prior entries are stored in the *APN HISTORY* pull-down menu.

- **SMTP Settings** - SMTP, or Simple Mail Transfer Protocol, relates to the server settings of the SIM provider being used to transmit data from the corrector, i.e. similar to air time on a cell phone. The *Port* setting is normally 25 for this type of communication, but can in some cases vary. The server is that server allocated to handle communication using the selected SIM. The *User* and *Password* are not obligatory. In a majority of

cases it is left blank. *Sender* is the sender's email address, in the form of: data@example.com. Where the sending of non deliverables and other internet warnings are sent, and is obligatory. The *Domain* is allocated by the email provider on request when a domain is required. In the case of no domain being required, as in a majority of cases, it is obligatory to put something in this field (the word Domain is recommended, as seen in Figure 13).

- Once all fields have been completed, press the OK button. When you have returned to the 'MC Comms Setting' screen, press the 'Data Settings' button.
- The data settings are to be applied according to the customer / end user requirements. See Figure 14.

The screenshot shows the 'Data Settings' dialog box. It is titled 'Data Settings' and has a close button in the top right corner. The dialog is divided into three main sections. The left section contains three log configuration boxes: 'Log 1', 'Log 2', and 'Log 3'. Each box has a 'Number of Logs to' field (all set to 5) and a 'Time to Send Email' field (Log 1: 2:15 PM, Log 2: 10:00 PM, Log 3: 6:00 AM). The middle section is titled 'Fault Email Parameters' and contains a list of checkboxes: Line Pressure Fault, Temperature Fault, Volume (Wiegand) Fault, Internal Operations Fault, Low Battery, DP Transducer Fault, Overspeed, Meter DP Fault, Lock Up Fault, and Meter DP Zero Fault. The 'Low Battery', 'Overspeed', 'Meter DP Fault', and 'Lock Up Fault' checkboxes are checked. The right section is titled 'Alarm Email Parameters' and contains a list of checkboxes: High Pressure Alarm, Low Pressure Alarm, High Temperature Alarm, Low Temperature Alarm, High Flow Rate Alarm, Low Flow Rate Alarm, Digital Input Alarm, Digital Output Alarm, High Monitor Pressure Alarm, Low Monitor Pressure Alarm, and Meter DP Alarm. The 'High Flow Rate Alarm' and 'Meter DP Alarm' checkboxes are checked. At the bottom of the dialog are 'Cancel' and 'OK' buttons.

Figure 14 – Parameter Settings (For Email)

Assuming that the logging parameters have already been set (see Chapter 11), select the number of logs and the time each day that an email containing that logging data is required. Also select the fault and alarm conditions for which you require email. Once a selection has been made, press OK, and then OK again on the 'MC Comms Setting' screen. Then upload all setting changes to the Micro Corrector.

Note: Monitor pressure alarms are only available for units with an external monitoring pressure transducer. Likewise, DP faults/alarms are only available for IMC/W2-dp units.

6.7.3 Dial Out Alert Option

NOTE: The Dial Out Alert option is only available for IMC/W2 firmware versions 1.93 or newer. For older versions refer to *Section 9.3: Fault Dialout Settings & Section 9.6: Alarm Dialout Settings.*

- After selecting the “Dial Out Alert” check box, the ‘Phone Settings’ button becomes active. Select the ‘Phone Settings’ button and the screen in Figure 15 appears. Enter Fault and Alarm telephone numbers, and press OK.

The screenshot shows a 'Phone Settings' dialog box with the following fields and values:

- Modem Model: Dial Only Alert
- Telephone Numbers:
 - Fault Dial-out: xxx-xxx-xxxx
 - Alarm Dial-out: yyy-yyy-yyyy
- SMTP Settings:
 - Port: 25
 - Server: mail.wyless.net
 - User: (empty)
 - Password: (empty)
 - Sender: sender
 - Domain: domain
 - DNS1: 0 . 0 . 0 . 0
 - DNS2: 0 . 0 . 0 . 0
 - Authentication: PAP

Figure 15 – Phone Settings (only applicable for Firmware versions 1.93 or newer)

- Once you have returned to the ‘MC Comms Setting’ screen, press the ‘Data Settings’ button (refer to Figure 16 on Page 37) to select dialout parameters. *Note: Log 1, Log 2, and Log 3 fields will be inactive for telephone dialout settings (these are only active for Email settings).*

Data Settings [X]

Log 1
 Number of Logs to: 5
 Time to Send Email: 2:15 PM

Log 2
 Number of Logs to: 5
 Time to Send Email: 10:00 PM

Log 3
 Number of Logs to: 5
 Time to Send Email: 6:00 AM

Fault Dial Only Alert

- Line Pressure Fault
- Temperature Fault
- Volume (Wiegand) Fault
- Internal Operations Fault
- Low Battery
- DP Transducer Fault
- Overspeed
- Meter DP Fault
- Lock Up Fault
- Meter DP Zero Fault

Alarm Dial Only Alert

- High Pressure Alarm
- Low Pressure Alarm
- High Temperature Alarm
- Low Temperature Alarm
- High Flow Rate Alarm
- Low Flow Rate Alarm
- Digital Input Alarm
- Digital Output Alarm
- High Monitor Pressure Alarm
- Low Monitor Pressure Alarm
- Meter DP Alarm

Cancel OK

Figure 16 – Parameter Settings (For Dial Out Alert)

6.8 Save Configuration File

The MCUT provides the facility to save configuration files. This may be beneficial when it is necessary to configure several IMC/W2's with the same configuration data, as the file can be opened by the MCUT, and then uploaded to the IMC/W2. It is possible to save both uploaded parameters (displayed with white background) and changed parameters (highlighted yellow).

To save a configuration to a file:

- On the *Configuration* screen select the *Save Configuration File* option and the *Save As* dialog box will be displayed.
- Determine the location on your PC where the configuration file is to be saved.
- Enter the desired file name that the configuration file is to be saved to. A default file name will be displayed which may also be used.
- Select the *Save* option.
- A dialog box will be displayed stating *Configuration Saved*, select *OK*.
- The configuration data is now saved to the file. All configuration files have an “.mc” file extension.

6.9 Open Configuration File

The MCUT provides the facility to open a previously saved configuration file to an IMC/W2. This may be beneficial when it is necessary to configure several IMC/W2's with the same configuration data.

To open a previously saved configuration file:

- On the *Configuration* screen select the *Open Configuration File* option and the *Open* dialog box will be displayed.
- Locate and select the configuration file required to be uploaded to the IMC/W2. The configuration file will have the “.mc” file extension.
- Select *Open*.
- A dialog will be displayed stating *Configuration Restored*, select *OK*.
- The configuration details will now be restored to the MCUT. Any changed parameters will be highlighted yellow on the parameters selection list.
- To ensure that the configuration details are uploaded to the IMC/W2 select the *Upload to MC* option. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. A dialog will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white background.

6.10 UT Comms Settings

Communications to the IMC/W2 may be conducted directly or remotely, via modem. The operator is able to specify which communications port is to be used for direct communications (com 1 to com 8), and the modem configuration for remote communications, refer to Figure 17. The recommended modem settings are detailed in Table 5 (*Modem Settings Reference Table*).

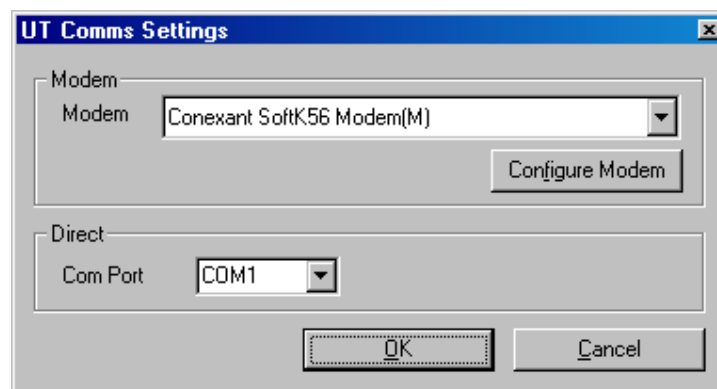


Figure 17 - UT communication settings Screen

To specify the communications port for in the MCUT:

- On the *Configuration* screen select the *UT Comms Settings* option and the *UT Comms Settings* screen will be displayed – see Figure 17 on page 38.
- From the *Direct* section, select the *Com Port* drop down selection box. Select the appropriate com port.
- Select OK on the *UT Comms Settings* screen.

Note: If PC is not equipped with serial communication port then a USB serial port adaptor could be used. Follow the following procedure to find out Com Port assignment.

- Open Control Panel;
- Select System;
- Select Hardware;
- Select Device Manager;
- Check Ports (COM & LPT) to find out Com Port assignment for USB serial port adaptor.

To configure the PC modem settings in the MCUT:

- On the *Configuration* screen select the *UT Comms Settings* option and the *UT Comms Settings* screen will be displayed – See Figure 17 on Page 38.
- In the *Modem* section, select the *Modem* drop down selection box. Select the PC modem that is to be used for remote communications to the IMC/W2.
- Select the *Configure Modem* option. The connection details will be displayed along with the *Modem Settings* screen – See Figure 18.
- Set the modem settings to the required configuration (as described in the *Modem Settings* dialog or Table 5 (*Modem Settings Reference Table*)), and select *OK*.

Note:

If Dresser Model 108 Line Modem is used with IMC/W2 then the baud rate (port speed) for PC modem has to be set to 2400.

If Dresser GSM Modem is used with IMC/W2 then the maximum baud rate for the PC modem can be set as 9600. Make sure that this same baud rate is set for the GSM modem - refer to chapter 6.7.1.

- Select OK on the *UT Comms Settings* screen.
- The modem is now ready for remote communications. In order to connect to the IMC/W2 via the modem, it is necessary to re-launch the MCUT, and specify that the modem should be used to connect (within the *Configuration* screen), before selecting *Connect with MC*. See Section 12 (*Modem Communications*) for further details.

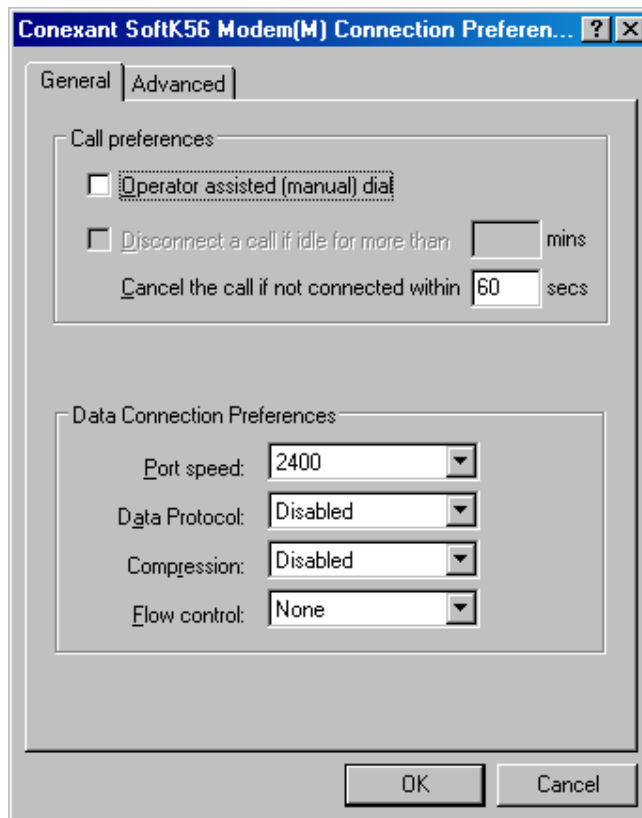


Figure 18 - Configure Modem Screen (for Windows XP)

Table 5 – Modem Settings Reference Table

Windows 95, 98		
General Tab	Speed	as required
Connection Tab	Data bits	8
	Parity	None
	Stop bits	1
	Wait for dial tone before dialling	Off
Advanced Option	Use Error Control	Off
	Use Flow Control	Off
	Modulation Type	Standard
Windows XP		
General Tab	Port speed	1200
Advanced Tab	Data bits	8
	Parity	None
	Stop bits	1

6.11 Create Report

The IMC/W2 MCUT provides a *Create Report* facility. A read only report is generated which details the configuration of the IMC/W2. The operator is able to enter a report heading via the keyboard; this could reflect the configuration type (e.g. B Series 3M meter) or meter location reference (e.g. south 1). The report can include a *data snapshot* of the data stored in the IMC/W2, the additional information displayed in this report is listed below, and includes data specific to the IMC/W2 that the MCUT is communicating with.

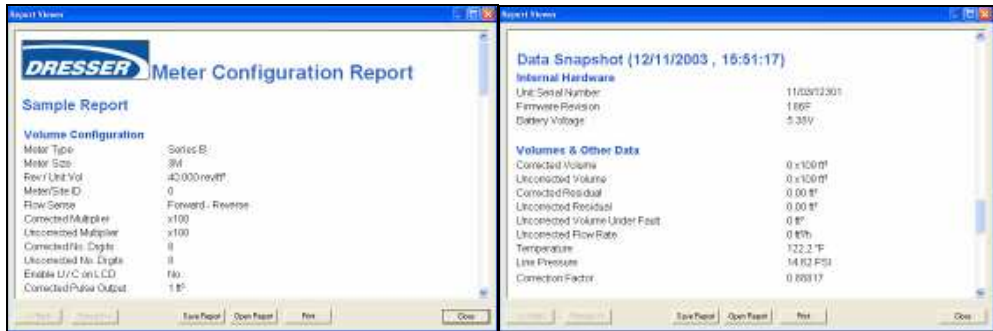


Figure 19 – Configuration Report

The information provided in the report includes (dependent on model and configuration of the IMC/W2):

- Volume configuration screen parameters.
- Corrections configuration screen parameters.
- Display Configuration.
- Alarm limits.
- Fault Dialout settings.
- Alarm Dialout settings.
- Logged parameters (including details of Log 1, Log 2 and Log 3).
- DP test parameters (only for DP-versions).

When a *data snapshot* is included within the report the following additional information is displayed (dependent on model and configuration of the IMC/W2):

- Unit serial number.
- Firmware revision.
- Battery voltage.
- Volumes data (including temperature, pressure and correction factor).
- Present fault(s) details (including differential & line pressures, temperature, volume, internal operation and low battery).
- Occurred fault(s) details (including differential & line pressures, temperature, volume, internal operation and low battery).

- Present alarm(s) details (including meter DP, high and low pressure, temperature and flow).
- Occurred alarm(s) details (including meter DP, high and low pressure, temperature and flow).

To create a configuration report:

- From the Report section of the *Configuration* screen, select the *Report Heading* text box. Enter the desired heading of the report.
- To include a data snapshot select the *Include Data Snapshot In Report* check box (ensure that a check is displayed in the appropriate check box).
- Select the *Create Report*.
- A report viewer will be displayed, containing all the required data. If the *data snapshot* is included the details can be found in the second half of the report, and will be entitled *Data Snapshot* along with the date and time that the data was retrieved.

6.12 Report Viewer / View Release Notes

The report viewer contains 6 options; these will enable the operator to *Save Report*, *Open Report* and *Print* reports. Selection of the *Save Report*, *Open Report*, and *Print* options will display the *Save As*, *Open* and *Print* dialogs common to the PC. If more than one report is opened in the report viewer the operator is able to navigate between files via the *Forward >>* and *<< Back* options. The *>> Forward* and *<< Back* options will only be enabled once more than one configuration file is displayed within the viewer.

Once selected the *View Release Notes* option on the *Welcome* screen will display a report detailing the changes / new features added to the latest release of the UT. The report is displayed within the *Report Viewer*: please note that the only options available when viewing the release notes in the *Report Viewer* are *Print* and *Close*.

7 Calibration Screen

Temperature and pressure recalibration should not be required, however the IMC/W2 may be temperature and pressure calibrated by the operator, using direct communications between the PC and IMC/W2. Various methods may be used and additional equipment is required. If there is reason to suspect that the temperature or pressure transducers are reading erroneously, or if an authorizing body (e.g. as required by *Weights and Measures* legislation) requires periodic checks on the transducers, the IMC/W2 meter should be taken out of the line and transported to a calibration factory. At this point the procedures outlined in the following sections should be followed ([7.1 \(Temperature Single Point Calibration\)](#), [7.2 \(Temperature Zero and Span Calibration\)](#), [7.3 \(Pressure Single Point Calibration\)](#) and section [7.4 \(Pressure Zero and Span Calibration\)](#)).

Note: If using the modem to connect, the options within the *Calibration* screen will be disabled.

To obtain temperature calibration points use one of the following methods:

1. Use temperature controlled baths with the IMC/W2 temperature probe and a calibrated thermometer for determining the bath temperatures. The thermometer's stated accuracy should be ± 0.1 degree.

OR

2. Simulate the temperature probe using a calibrated resistance box set to values corresponding to 2 different temperatures. If this option is chosen the thermometer probe must be disconnected from the IMC/W2 and the resistance box must be connected as a 4 wire resistor in its place.

Note: During calibration multiple temperature readings are automatically compared over a period to ensure that the readings are stable. If stability is not obtained the calibration process will not be successful.

To obtain pressure calibration points a dead weight tester (or other recognised pressure reference equipment) may be used to as a pressure reference. Additionally a barometer is required for absolute pressure transducer testing and calibration.

Note: It is generally a requirement that there should be a certificate of calibration traceable to national standards, for all devices used in the calibration process.

Upon selection of the *Calibration* tab the *Calibration* screen will be displayed. This screen is divided into 2 sections; *Temperature* and *Pressure*. Assuming connection with the IMC/W2 has already been established (see section [6.1 \(Connect with MC – Direct Connection to the IMC/W2\)](#)), then it is possible to calibrate both the temperature and pressure.

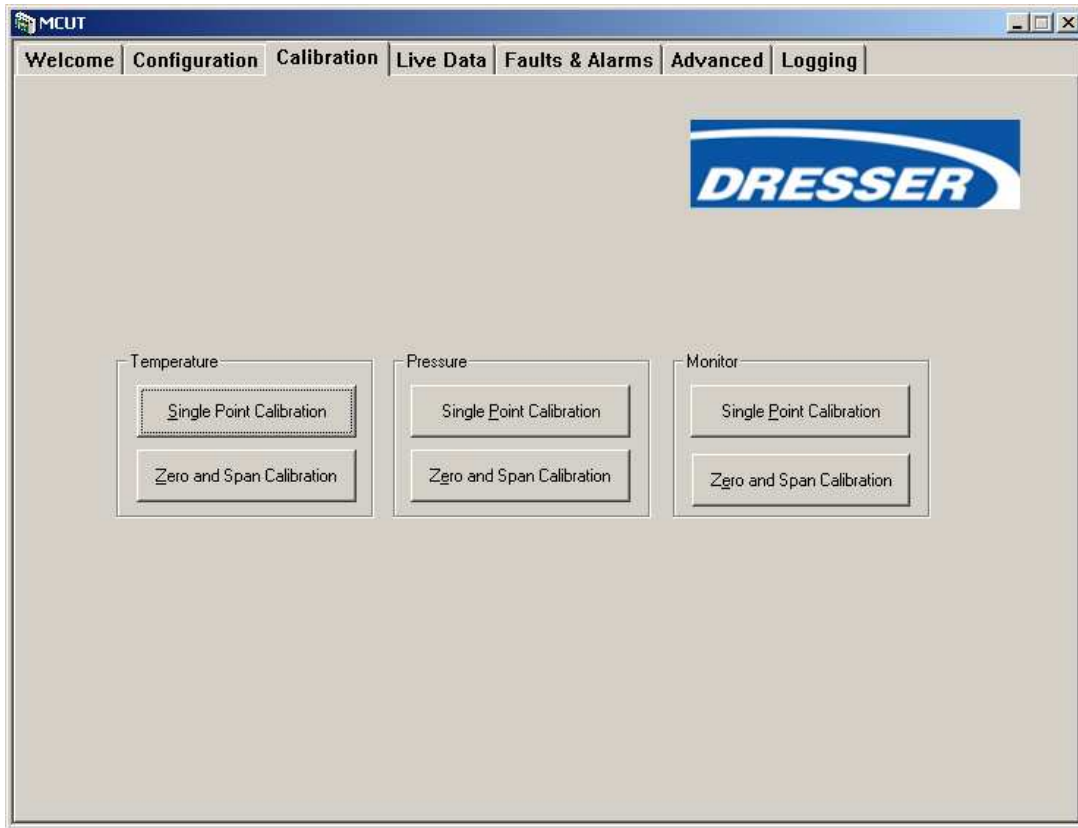


Figure 20 - Calibration Screen

To display the Calibration screen:

- From within the MCUT select the *Calibration* tab. The *Calibration* screen will be displayed.
- The options available on this screen depend on the model and configuration of the IMC/W2.
- Note: Pressure calibration of an IMC/W2 T-Only unit is not possible as no pressure transducer is fitted. If the IMC/W2 is configured to read a fixed pressure or temperature the associated calibration options will not be available. If a fixed temperature or pressure is used, the measurement modes must be set to live measurement within the MCUT for the appropriate parameter in order to calibrate the desired transducer.

Both *Single Point* and *Zero and Span* calibration can be done via the MCUT; this process is only possible via direct communication between the PC and IMC/W2.

7.1 Temperature Single Point Calibration

To calibrate a single point temperature:

- Ensure a calibrated predetermined temperature source is connected to the TB2 terminals of the IMC/W2 (methods outlined above).
- From within the *Calibration* screen select the temperature *Single Point Calibration* option. The *Temperature Calibration* dialog will be displayed.
- Select the *Update Live Temperature* option. The IMC/W2 temperature reading will be updated, displayed as read only text and labeled on the screen as *Live Temperature*.
- Select the *Offset Reference Temperature* text box, and enter the new temperature value.
- Select the *Upload Temperature Changes* option. Enter the password if appropriate and select *OK*, otherwise select *Cancel*.
- Once complete, a dialog box will be displayed stating *Offset Calibration Successful*, select *OK*. The *Temperature Calibration* selection will be displayed.
- Note: The difference between the *Offset Reference Temperature* and *Live Temperature* reading should be $\pm 9^{\circ}\text{F} / < \pm 5^{\circ}\text{C}$.
- From the *Temperature Calibration* screen, select the *Return to Calibration Screen* option. The *Calibration* screen will be displayed

To restore single point temperature calibration factory defaults:

- On the *Calibration* screen select the temperature *Single Point Calibration* option. The *Temperature Calibration* dialog will be displayed.
- Select the *Restore Factory Defaults* option. Enter the password if appropriate and select *OK*, otherwise select *Cancel*.
- Once complete a message will be displayed stating *Factory temperature calibration restored*. Select *OK*.
- The *Temperature Calibration* dialog will be displayed. Select the *Return to Calibration Screen* option; the *Calibration* screen will be displayed.

For further details please contact your Dresser Representative.

7.2 Temperature Zero and Span Calibration

To calibrate the temperature zero and span:

- Ensure a calibrated predetermined temperature source is connected to the TB2 terminals of the IMC/W2 (methods outlined above).
- On the *Calibration* screen select the temperature *Zero and Span Calibration* option. The *Temperature Calibration* screen will be displayed.
- Select the *Update Live Temperature* option. The IMC/W2 temperature reading will be updated, displayed as read only text, and labeled as *Live Temperature*.
- Select the *Zero Reference Temperature* text box and enter the desired zero reference temperature value. If the temperature you select is not feasible, a message to this effect will be displayed. NOTE: The range between zero and span must be at least 90 degrees F.
- Select the *Send Zero Calibration* option. Enter the password if appropriate and select *OK*, otherwise select *Cancel*.
- Once complete, a dialog box will be displayed stating *Zero Calibration Successful*, select *OK*.
- The *Send Span Calibration* option will now be available.
- Select the *Span Reference Temperature* text box and enter the desired span reference temperature. If necessary the operator will be informed of the accepted range. NOTE: The range between zero and span must be at least 90 degrees F.
- Select the *Send Span Calibration Option*. Enter the password if appropriate and select *OK*, otherwise select *Cancel*.
- Once complete, a dialog box will be displayed stating *Span Calibration Successful*, select *OK*. The *Temperature Calibration* screen will be displayed.
- From within the *Temperature Calibration* dialog select the *Return to Calibration Screen* option. The *Calibration* screen will be displayed.

To restore temperature zero and span calibration factory defaults:

- From within the *Calibration* screen select the temperature *Zero and Span Calibration* option. The *Temperature Calibration* dialog will be displayed.
- Select the *Restore Factory Defaults* option. Enter the password if appropriate and select *OK*, otherwise select *Cancel*.
- Once complete, a dialog box will be displayed stating *Factory temperature calibration restored*. Select *OK*.
- The *Temperature Calibration* screen will be displayed. Select the *Return to Calibration Screen* option; the *Calibration* screen will be displayed.

For further details please contact your Dresser Representative.

7.3 Pressure Single Point Calibration

To calibrate a single point pressure:

- Ensure a calibrated predetermined pressure source is connected to pressure transducer of the IMC/W2 (methods outlined above).
- On the *Calibration* screen, select the pressure *Single Point Calibration* option. The *Pressure Calibration* screen will be displayed.
- Select the *Update Live Pressure* option. The IMC/W2 pressure reading will be updated, displayed as read only text and labeled as *Live Pressure*.
- Select the *Offset Reference Pressure* text box, and enter the new pressure transducer value.
- Select the *Upload Pressure Changes* option. Enter the password if appropriate and select *OK*, otherwise select *Cancel*.
- Once complete a dialog will be displayed stating *Offset Calibration Successful*, select *OK*. The *Pressure Calibration* dialog will be displayed.
- Note: The difference between the *Offset Reference Pressure* and *Live Pressure* reading should be $< \pm 1.74 \text{ PSI} / \pm 0.12 \text{ bar}$.
- On *Pressure Calibration* screen select the *Return to Calibration Screen* option. The *Calibration* screen will be displayed.

To restore single point pressure calibration factory defaults:

- On the *Calibration* screen, select the pressure *Single Point Calibration* option. The *Pressure Calibration* screen will be displayed.
- Select the *Restore Factory Defaults* option. Enter the password if appropriate and select *OK*, otherwise select *Cancel*.
- Once complete, a dialog box will be displayed stating *Factory temperature calibration restored*. Select *OK*.
- From The *Pressure Calibration* dialog will be displayed. Select the *Return to Calibration Screen* option; the *Calibration* screen will be displayed.

For further details please contact your Dresser Representative.

7.4 Pressure Zero and Span Calibration

To calibrate the pressure zero and span:

- Ensure a calibrated predetermined pressure source is connected to the pressure transducer of the IMC/W2 (methods outlined above).
- On the *Calibration* screen select the pressure *Zero and Span Calibration* option. The *Pressure Calibration* screen will be displayed.
- Select the *Update Live Temperature* option. The IMC/W2 pressure will be updated, displayed as read only text and labeled as *Live Pressure*.
- Select the *Zero Reference Pressure* text box and enter the desired zero reference pressure value. If necessary the operator will be informed of the acceptable range. NOTE: The difference between the zero and span pressure readings must be at least 50% of the F.S. range of the line transducer installed in the IMC/W2.
- Select the *Send Zero Calibration* option. Enter the password if appropriate and select *OK*, otherwise select *Cancel*.
- Once complete, a dialog box will be displayed stating *Zero Calibration Successful*, select *OK*.
- The *Send Span Calibration* option will now be available.
- Select the *Span Reference Pressure* text box and enter the desired span reference pressure. If necessary the operator will be informed of the acceptable range. NOTE: The difference between the zero and span pressure readings must be at least 50% of the F.S. range of the line transducer installed in the IMC/W2.
- Select the *Send Span Calibration Option*. Enter the password if appropriate and select *OK*, otherwise select *Cancel*.
- Once complete, a dialog box will be displayed stating *Span Calibration Successful*, select *OK*. The *Pressure Calibration* screen will be displayed.
- On the *Pressure Calibration* screen, select the *Return to Calibration Screen* option. The *Calibration* screen will be displayed.

To restore temperature zero and span calibration factory defaults:

- On the *Calibration* screen select the pressure *Zero and Span Calibration* option. The *Pressure Calibration* screen will be displayed.
- Select the *Restore Factory Defaults* option. Enter the password if appropriate and select *OK*, otherwise select *Cancel*.
- Once complete, a dialog box will be displayed stating *Factory temperature calibration restored*. Select *OK*.
- The *Pressure Calibration* dialog will be displayed. Select the *Return to Calibration Screen* option; the *Calibration* screen will be displayed.

For further details please contact your Dresser Representative.

7.5 Monitor Pressure Single Point Calibration

To calibrate a single point monitor pressure:

- Ensure a calibrated predetermined pressure source is connected to monitor pressure transducer of the IMC/W2 (methods outlined above).
- On the *Calibration* screen select the pressure *Single Point Calibration* option. The *Pressure Calibration* dialog will be displayed.
- Select the *Update Live Pressure* option. The IMC/W2 pressure reading will be updated, displayed as read only text and labeled as *Live Pressure*.
- Select the *Offset Reference Pressure* text box, and enter the new pressure transducer value.
- Select the *Upload Pressure Changes* option. Enter the password if appropriate and select *OK*, otherwise select *Cancel*.
- Once complete, a dialog box will be displayed stating *Offset Calibration Successful*, select *OK*. The *Pressure Calibration* screen will be displayed.
- Note: The difference between the *Offset Reference Pressure* and *Live Pressure* reading should be $< \pm 1.74 \text{ PSI} / \pm 0.12 \text{ bar}$.
- On the *Pressure Calibration* screen select the *Return to Calibration Screen* option. The *Calibration* screen will be displayed.

To restore single point monitor pressure calibration factory defaults:

- From within the *Calibration* screen select the pressure *Single Point Calibration* option. The *Pressure Calibration* dialog will be displayed.
- Select the *Restore Factory Defaults* option. Enter the password if appropriate and select *OK*, otherwise select *Cancel*.
- Once complete a dialog will be displayed stating *Factory temperature calibration restored*. Select *OK*.
- From The *Pressure Calibration* dialog will be displayed. Select the *Return to Calibration Screen* option; the *Calibration* screen will be displayed.

For further details please contact your Dresser Representative.

7.6 Monitor Pressure Zero and Span Calibration

To calibrate the monitor pressure zero and span:

- Ensure a calibrated predetermined pressure source is connected to the monitor pressure transducer of the IMC/W2 (methods outlined above).
- On the *Calibration* screen select the pressure *Zero and Span Calibration* option. The *Pressure Calibration* screen will be displayed.
- Select the *Update Live Temperature* option. The IMC/W2 pressure will be updated, displayed as read only text and labeled as *Live Pressure*.
- Select the *Zero Reference Pressure* text box and enter the desired zero reference pressure value. If necessary the operator will be informed of the acceptable range. NOTE: The difference between the zero and span pressure readings must be at least 50% of the F.S. range of the line transducer installed in the IMC/W2.
- Select the *Send Zero Calibration* option. Enter the password if appropriate and select *OK*, otherwise select *Cancel*.
- Once complete, a dialog box will be displayed stating *Zero Calibration Successful*, select *OK*.

- The *Send Span Calibration* option will now be available.
- Select the *Span Reference Pressure* text box and enter the desired span reference pressure. If necessary the operator will be informed of the acceptable range. NOTE: The difference between the zero and span pressure readings must be at least 50% of the F.S. range of the line transducer installed in the IMC/W2.
- Select the *Send Span Calibration Option*. Enter the password if appropriate and select *OK*, otherwise select *Cancel*.
- Once complete, a dialog box will be displayed stating *Span Calibration Successful*, select *OK*. The *Pressure Calibration* dialog will be displayed.
- On the *Pressure Calibration* dialog select the *Return to Calibration Screen* option. The *Calibration* screen will be displayed.

To restore monitor pressure zero and span calibration factory defaults:

- On the *Calibration* screen select the pressure *Zero and Span Calibration* option. The *Pressure Calibration* dialog will be displayed.
- Select the *Restore Factory Defaults* option. Enter the password if appropriate and select *OK*, otherwise select *Cancel*.
- Once complete, a dialog box will be displayed stating *Factory temperature calibration restored*. Select *OK*.
- The *Pressure Calibration* dialog will be displayed. Select the *Return to Calibration Screen* option; the *Calibration* screen will be displayed.

For further details please contact your Dresser Representative.

8 Live Data Screen

Select the *Live Data* screen. This read only function provides the operator with a *read only* screen from which it is possible to view a *data snapshot* (which may be updated as often as required). The information provided by the *data snapshot* includes (dependent on model selected):

- Unit serial number.
- Meter / Site ID.
- Firmware and PCB revision.
- Battery Voltage.
- Monitor Pressure.
- Corrected and uncorrected volumes.
- Corrected and uncorrected residual.
- Uncorrected flow rate volume.
- Uncorrected under fault volume.
- Temperature reading.
- Line pressure reading.
- Supercompressibility.
- Correction factor.
- Details of all present faults and alarms.
- Details of all occurred faults and alarms.
- Monitor pressure results (only for external monitor pressure versions).
- Differential pressure results (only for DP-versions).

In a fault condition, the appropriate *Present Fault* indicator is displayed as a red square with a 1. Figure 21 (*Live Data Screen*) displays the *Present Faults* register as clear, i.e. there are no faults present; the appropriate indicators are displayed as a green square with a 0. Please refer to section 9 ([Faults & Alarms Screen](#)) for further details.

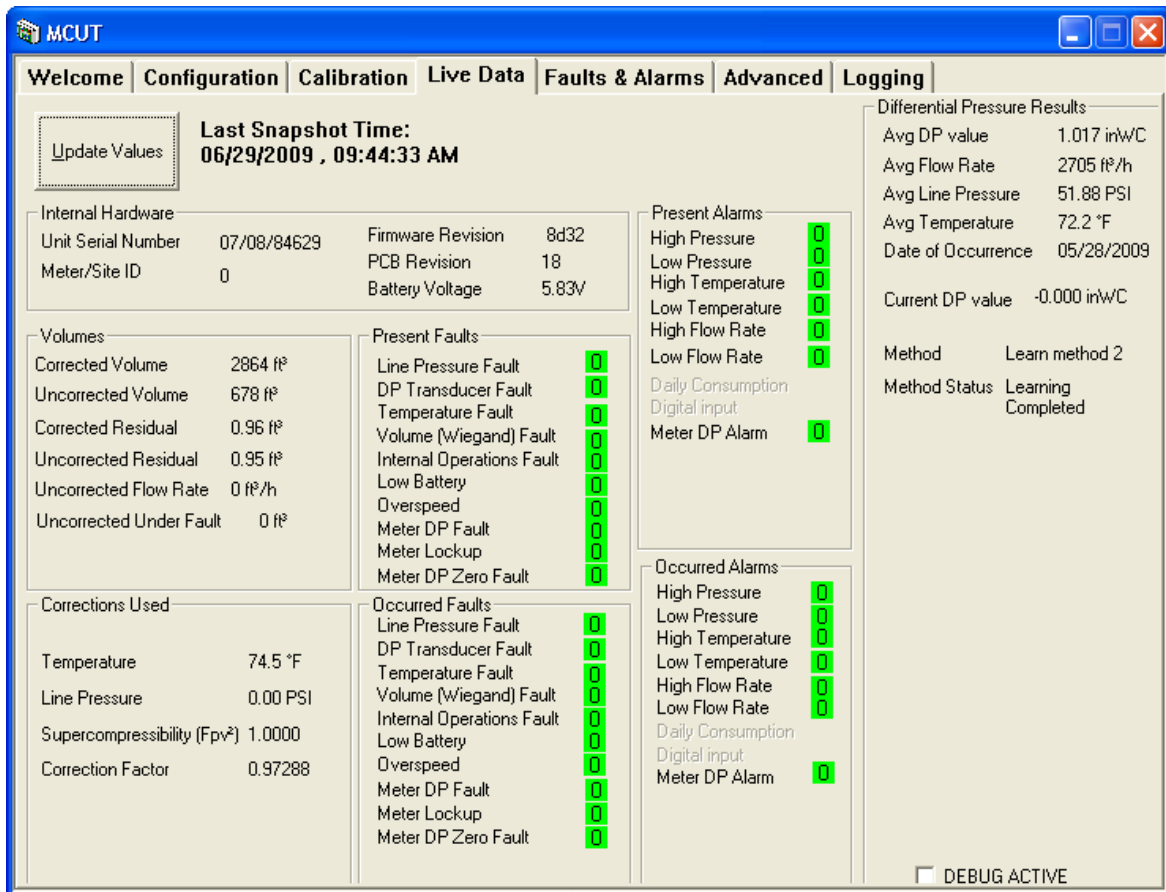


Figure 21 - Live Data Screen (DP-version shown)

To display the live data screen:

- In the MCUT, select the *Live Data* tab. The *Live Data* screen will be displayed.
- The options available on this screen depend on the model and configuration of the IMC/W2.

To update values:

- On the *Live Data* screen, select the *Update Values* option.
- The values on the screen will be updated.

9 Faults & Alarms Screen

Select the *Faults and Alarms* screen. On this screen it is possible to set the alarm limits, specify the information to be displayed on the LCD in an alarm condition, specify whether a pulse output is to be generated in alarm conditions, clear the uncorrected volume under fault, and clear occurred alarms and faults.

A *Monitor Calls* facility is available on this screen for Firmware Versions 1.91 and older. This enables the MCUT to run in *call monitor* mode. While in this mode, the user may receive telephone calls via the modem from the IMC/W2 (subject to operator configuration); such dialouts from the IMC/W2 are invoked in specified alarm conditions. The information displayed in the *Call Monitor* dialog contains information regarding the alarm condition – date and time, IMC/W2 serial number, meter / site ID and type of alarm / fault. The call monitor facility requires the use of a PC modem along with a Dresser Micro Modem that should be connected to the IMC/W2. For further details refer to section [9.7 \(Call Monitor\)](#).

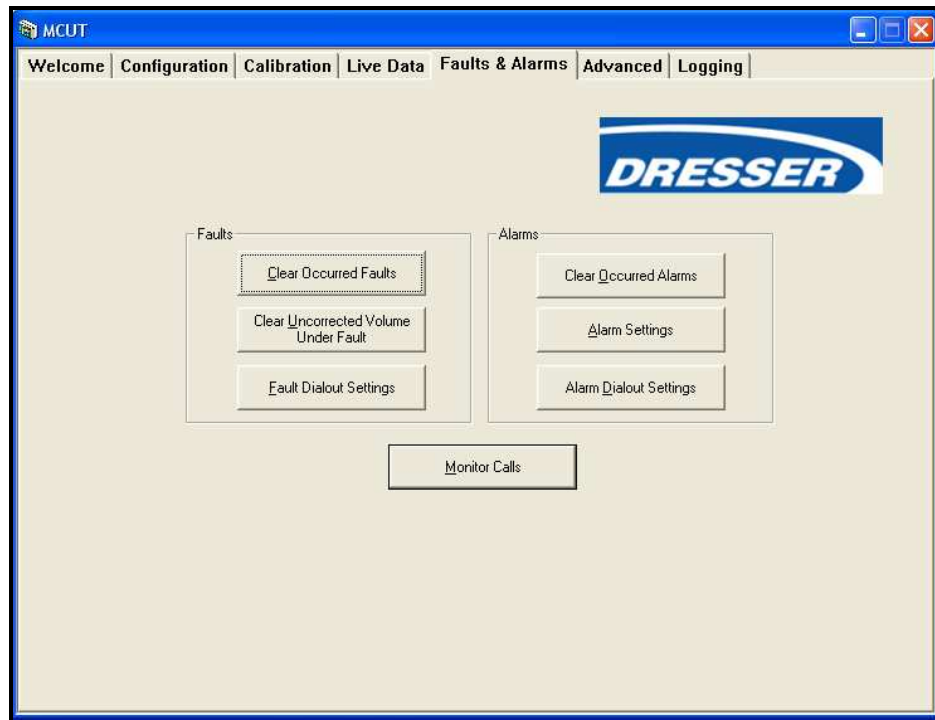


Figure 22 - Faults and Alarms Screen

To display the faults and alarms screen:

- In the MCUT select the *Faults & Alarms* tab. The *Faults & Alarms* screen will be displayed.
- Note: The *Monitor Calls* function requires the use of a modem, with both the PC and IMC/W2 (the modem used in conjunction with the IMC/W2 must be intrinsically safe (e.g. Dresser Micro Modem)).

9.1 Clear Occurred Faults

A fault is described as a measurement reading that exceeds its acceptable range. This may be caused, for example, by exceeding the stated pressure range of the transducer. When a fault condition occurs, an intuitive indication is displayed on the LCD indicating the nature of the fault (see Table 6 (*Fault Code Reference Table*)). A download from the unit via the MCUT will show that the appropriate icon(s) within *Present Faults* and *Occurred Faults* section of the *Live Data* screen are displayed with a red square with a 1. When the nature of the problem is determined and resolved, the icon on the *Present Faults* section of the *Live Data* screen will return to green with a 0 and the fault code on the LCD will no longer be displayed. The appropriate icon on the *Occurred Faults* screen will remain red with a 1 until the occurred faults register has been cleared. This process can be carried out via the *Faults & Alarms* screen (see section 10.1 (*Clear Occurred Faults*)), alternatively, by scrolling through the LCD parameters until the test screen is displayed (scrolling 8's), remain on the test screen until the CLr FLt is displayed. Press the IMC/W2 selector button and this will clear the occurred faults register. Following the selection of the *Update Values* options on the *Live Data* screen the icon on the *Occurred Faults* section will return to green with a 0.

Table 6 – Fault Code Reference Table

LCD Fault Code	Fault Condition
Lo Batt	Low Battery
Int FLt	Internal Operations Fault
P FLt	Pressure Fault
Pm FLt	Monitor Pressure or DP Transducer Fault
t FLt	Temperature Fault
VoL FLt	Volume Fault
dP ZErro	Meter DP Zero Fault
dP FLt	DP Fault
dP LOC	Meter Lock-up Fault
OS FLt	Over-Speed Fault

Note: An overspeed fault has been added to MCUT version 2.0.1.3. The overspeed fault is set if the uncorrected flow rate through the gas meter exceeds the maximum flow rate by a specific value that depends on meter type/size. Value of overspeed flow rate (% of Q_{max}) can be viewed in the MCUT on the “Meter Diagnostic range” screen. If set, then “OS FLt” is shown on the LCD and fault output pulses are generated.

To clear occurred faults registry:

- From the *Faults & Alarms* screen, select the *Clear Occurred Faults* option.
- The faults will be cleared. A dialog box will be displayed stating *Faults Cleared OK*, select *OK*.
- The cleared fault can be confirmed by selecting the *Update Values* option on the *Live Data* screen. Providing the fault condition has been cleared, and the occurred faults register has been cleared, all icons on the *Present Faults* and *Occurred Faults* sections will be green with a 0.
- If the problem persists, contact your Dresser Representative.

9.2 Clear Uncorrected Volume Under Fault

In all fault conditions, the *Uncorrected Under Fault* volume register will be activated showing the total number of accumulated uncorrected volume units during the period in which the fault was present. Only faults that affect the correction factor will cause the *Uncorrected Under Fault* register to be activated. Under these conditions, both the *Uncorrected Volume* and the *Uncorrected Under Fault* volume will continue to increment, however the *Corrected Volume* register will no longer be activated (this register will be re-activated once the fault condition has been cleared). This allows the operator to calculate the average correction factor for that period from the 3 readings, which can then be applied to the fault counts to give an estimated corrected volume for the fault period.

To clear uncorrected volume under fault register:

- On the *Faults & Alarms* screen, select the *Clear Uncorrected Volume Under Fault* option.
- The uncorrected volume under fault register is password protected, therefore a password must be entered in order to clear this log. A dialog box will be displayed stating *Faults Cleared OK*, select *OK*.
- The uncorrected volume under fault register will be cleared.
- The cleared register can be confirmed by selecting the *Update Values* option on the *Live Data* screen. The *Uncorrected Under Fault* register value in the *Volumes* section will be set to 0.

9.3 Fault Dialout Settings

NOTE: The following only applies to firmware versions 1.91 or older. For versions 1.93 or newer refer to Section 6.7.3: Dial Out Alert Option.

The call monitor facility enables the IMC/W2 to dial a PC modem, via the Micro Modem in the event of certain operator configured circumstances. The operator is able to specify which fault conditions the IMC/W2 should dialout. The fault conditions in which the IMC/W2 is able to dialout include (dependent on model and configuration):

- Line pressure fault.
- Temperature fault.
- Volume (Wiegand) fault.
- Internal operations fault.
- Low battery.
- Monitor Pressure.

The operator is also able to specify the telephone number that the IMC/W2 should dialout to (i.e. the modem connected to the PC that the IMC/W2 should connect to).

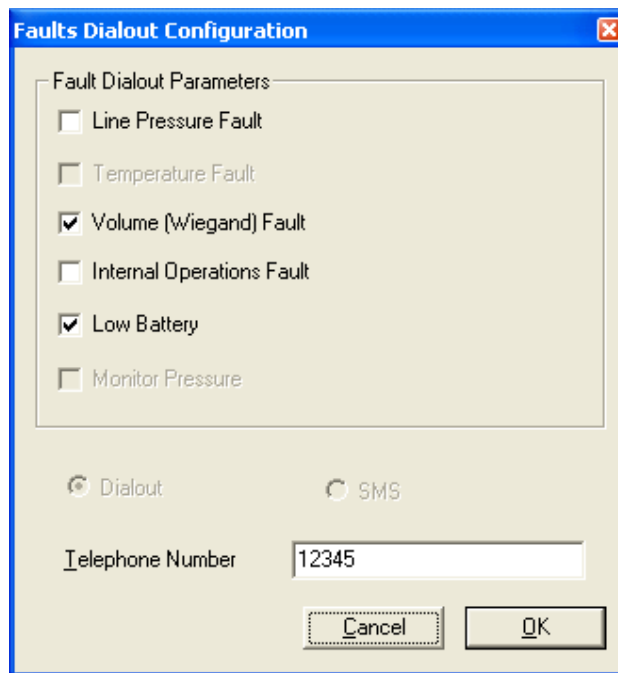


Figure 23 - Faults Dialout Configuration Screen

To specify the dialout under fault condition parameters:

- From the *Faults & Alarms* screen select the *Fault Dialout Settings* option and the *Fault Dialout Configuration* screen will be displayed.
- The available parameters that can be set to dialout when a fault condition arises are displayed on this screen. Select the parameter that is required to dialout under a fault condition; ensure that a check is displayed in the appropriate check box. If a parameter is disabled it may be because it is not available.
- Note: If the IMC/W2 is set to read a fixed pressure or temperature, the respective parameters will be disabled. To enable the dialout on these parameters the measurement mode must be switched to Live Measurement.
- Select the *Telephone Number* text box and enter the desired telephone number. (The new parameters will need to be uploaded to the IMC/W2 via the *Configuration* screen).
- Select the *OK* option within the *Fault Dialout Configuration* dialog.
- Select the *Configuration* tab; the *Configuration* screen will be displayed.
- The changed parameters will be highlighted yellow in the parameter selection list on the *Configuration* screen.
- Select *Upload to MC*.
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

- Note: To disable the fault dialout, select the appropriate parameter; ensure that the check is removed from the check box. Select *OK*, within the *Alarm Settings* dialog. On the *Configuration* screen select the *Upload to MC* option. On display of the *Sent OK* message select *OK*.

9.4 Clear Occurred Alarms

An alarm can be described as a measurement reading exceeding operator configurable limits. This is not a fault on the unit. It may be used as a means of monitoring the system remotely. When an alarm condition occurs, an appropriate alarm code is displayed on the LCD (see table 7 (*Alarm Code Reference Table*)). The appropriate icon(s) within *Present Alarms* and *Occurred Alarms* section of the *Live Data* screen are displayed with a red square with a *1*. When the nature of the problem is determined and resolved, the icon in the *Present Alarms* section of the *Live Data* screen will return to green with a *0*, and the alarm code on the LCD will no longer be displayed. The appropriate icon on the *Occurred Alarms* screen will remain red with a *1*, until the occurred alarms register has been cleared. Following the selection of the *Update Values* options on the *Live Data* screen, and once the occurred alarms have been cleared, the icon in the *Occurred Alarms* section will return to green with a *0*.

Table 7 – Alarm Code Reference Table

LCD Alarm Code	Alarm Condition
HF AL	High Flow Rate Alarm
LF AL	Low Flow Rate Alarm
Ht AL	High Temperature Alarm
Lt AL	Low Temperature Alarm
HP AL	High Pressure Alarm
LP AL	Low Pressure Alarm
D_In_AL / tAnnPEr	Digital Input / Tamper Alarm
vol AL	High Consumption Alarm
dP AL	DP Alarm

To clear occurred alarms register:

- On the *Faults & Alarms* screen select the *Clear Occurred Alarms* option.
- The alarms will be cleared. A dialog box will be displayed stating *Alarms Cleared OK*, select *OK*.
- The cleared alarm can be confirmed by selecting the *Update Values* option on the *Live Data* screen. Providing the alarm condition has been cleared and the occurred alarms register has been cleared, all icons in the *Present Alarms* and *Occurred Alarms* sections will be green with a *0*.

9.5 Alarm Settings

The operator is able to specify alarm limits in the MCUT, for the following:

- High pressure.
- Low pressure.
- High temperature.
- Low temperature.
- High flow rate.
- Low flow rate.

Note: Settings for Digital Input, Digital Output (High Consumption Alarm), and Meter Lockup Output are performed on *Advanced* Screen. The operator is also able to specify which alarms should be displayed on the LCD, and whether or not output pulses should be induced for the various alarm conditions.

Note: Meter DP Alarm is also available on Firmware Version 1.93 and higher. However, this alarm is not configurable. It is displayed on the *Live Data* Screen and can be configured to display on the LCD as well. Additionally, it can be configured to be sent via a pulse output.

To set the alarm limits:

- From the *Faults & Alarms* screen select the *Alarm Settings* option and the *Alarm Settings* dialog will be displayed.
- Select the appropriate text box and enter the desired alarm limit; if an invalid value is entered the operator will be advised of the acceptable range. (The new parameters will need to be uploaded to the IMC/W2 via the *Configuration* screen).
- Select the *OK* option on the *Alarm Settings* screen.
- Select the *Configuration* tab; the *Configuration* screen will be displayed.

- The changed parameters will be highlighted yellow in the parameter selection list on the *Configuration* screen.
- Select *Upload to MC*. (Enter the password if appropriate, and select *OK*, otherwise select *Cancel*).
- The new details will be uploaded to the IMC/W2. On completion a dialog will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

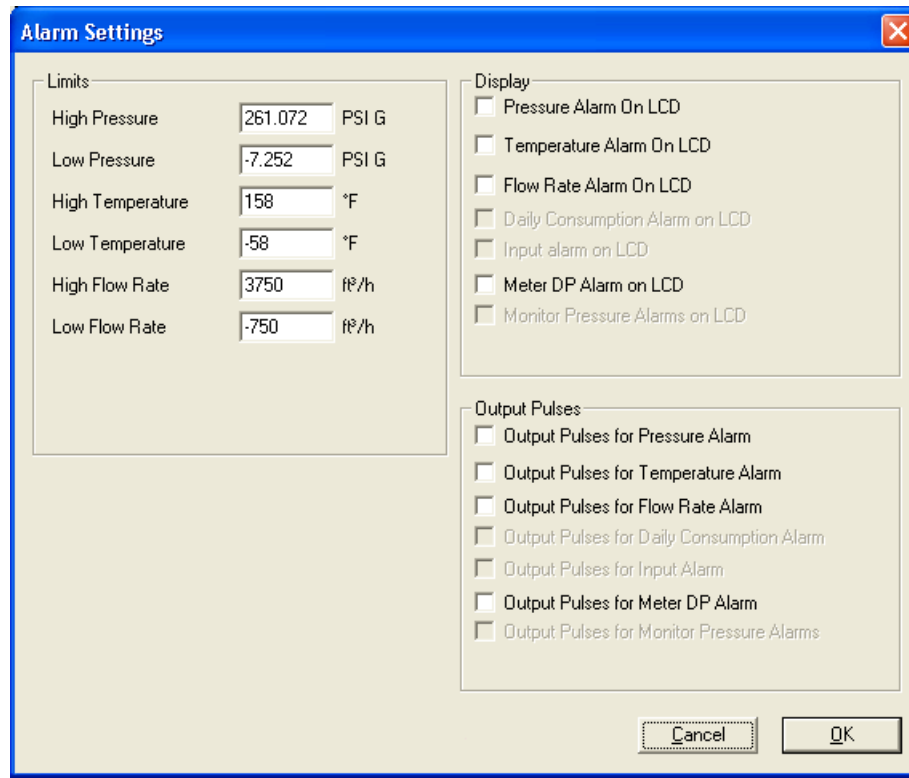


Figure 24 - Alarm Settings Configuration (DP-version shown)

Table 8 – Alarm Parameter / Alarm Limits Reference Table

Alarm Parameter	Alarm Limit	
High Pressure	1.5 x maximum pressure of transducer	
Low Pressure	0.5 bar Absolute	7.252 PSI Absolute
	-0.5 bar Gauge	-7.525 PSI Gauge
High Temperature	70°C	158°F
Low Temperature	-50°C	-58°F
High Flow Rate	+ 1.5 x Q _{max} *	
Low Flow Rate	- 1.5 x Q _{max} *	

*The high and low flow rate alarm limits will automatically update when a new meter type and size are selected.

To specify the parameters to be displayed on the LCD in alarm conditions:

- From the *Faults & Alarms* screen select the *Alarm Settings* option; the *Alarm Settings* dialog will be displayed.
- From the *Display* section, select the parameter(s) that is / are required to be displayed on the LCD; ensure that a check is displayed in the appropriate check box. (The new parameters will need to be uploaded to the IMC/W2 via the *Configuration* screen). If a parameter is disabled it may be because it is not available on the IMC/W2 that you have. Consult your Dresser Representative for further details.
- Note: If the IMC/W2 is set to read a fixed pressure or temperature, the respective parameters will be disabled. To enable these parameters the measurement mode must be switched to Live Measurement.
- Select *OK* in the *Alarm Settings* dialog box.
- Select the *Configuration* tab; the *Configuration* screen will be displayed.
- Select *Upload to MC*.
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.

- Note: To switch an LCD displayed parameter off (so that it is not displayed in an alarm condition), select the appropriate parameter; ensure that the check is removed from the check box. Select *OK*, in the *Alarm Settings* dialog box. On the *Configuration* screen, select the *Upload to MC* option. Upon display of the *Sent OK* message, select *OK*.

To specify output pulses for alarm conditions:

- From the *Faults & Alarms* screen select the *Alarm Settings* option; the *Alarm Settings* screen will be displayed.
- From the *Output Pulses* section, select the parameter(s) that is / are required to invoke output pulses during an alarm condition, and ensure that a check is displayed in the appropriate check box. (The new parameters will need to be uploaded to the IMC/W2 via the *Configuration* screen). If a parameter is disabled it may be because it is not available on the IMC/W2 that you have. For further details contact your Dresser Representative.
- Note: If the IMC/W2 is set to read a fixed pressure or temperature, the respective parameters will be disabled. To enable these parameters the measurement mode must be switched to Live Measurement.
- Select *OK* within the *Alarm Settings* dialog.
- Select the *Configuration* tab; the *Configuration* screen will be displayed.
- Select *Upload to MC*.
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.
- Note: To disable output pulse in an alarm condition, select the appropriate parameter; ensure that the check is removed from the check box. Select *OK*, within the *Alarm Settings* dialog. On the *Configuration* screen select the *Upload to MC* option. On display of the *Sent OK* message select *OK*.

9.6 Alarm Dialout Settings

NOTE: The following only applies to firmware versions 1.91 or older. For versions 1.93 or newer refer to Section 6.7.3: Dial Out Alert Option.

The operator is able to specify in which alarm conditions the IMC/W2 should dialout; this is achieved in the same manner as specifying the dialout fault conditions (section [9.3 \(Fault Dialout Settings\)](#)). The alarm conditions for which the IMC/W2 is able to dialout include the following:

- High pressure alarm
- Low pressure alarm
- High temperature alarm
- Low temperature alarm
- High flow rate alarm
- Low flow rate alarm
- Digital Input/Tamper alarm

The operator is also able to specify the telephone number that the IMC/W2 should dialout to (i.e. the modem connected to the PC that the IMC/W2 should connect to).

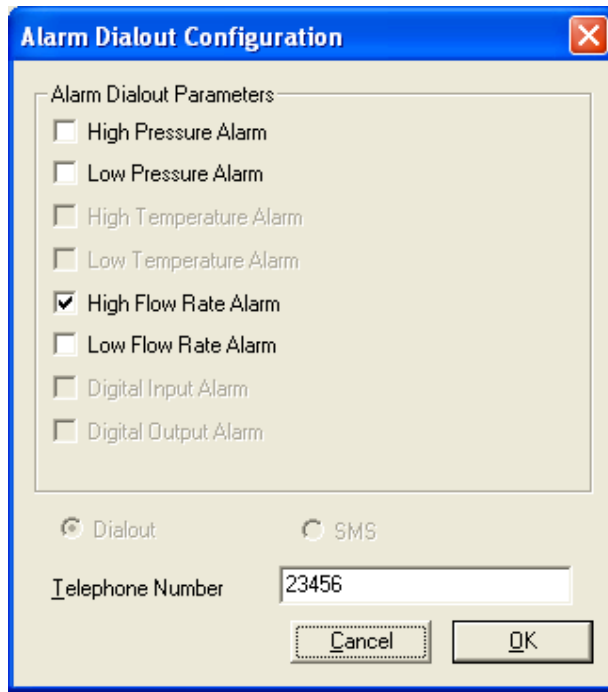


Figure 25 - Alarm Dialout Configuration Screen

To specify the dialout under alarm condition parameters:

- From the *Faults & Alarms* screen select the *Alarm Dialout Settings* option, the *Alarm Dialout Configuration* screen will be displayed.
- The available parameters that can be set to dialout when an alarm condition arises are displayed on this screen.
- Select the parameter that is required to dialout under an alarm condition; ensure that the check is display in the appropriate check box. If a parameter is disabled it may be because it is not available.
- Note: If the IMC/W2 is set to read a fixed pressure or temperature the respective parameters will be disabled. To enable the dialout on these parameters the measurement mode must be switched to Live Measurement.
- Select the *Telephone Number* text box and enter the desired telephone number. (The new parameters will need to be uploaded to the IMC/W2 via the *Configuration* screen).
- Select the *OK* option in the *Alarm Dialout Configuration* dialog box.
- Select the *Configuration* tab; the *Configuration* screen will be displayed.
- The changed parameters will be highlighted yellow in the parameter selection list on the *Configuration* screen.
- Select *Upload to MC*.
- The new details will be uploaded to the IMC/W2. On completion a dialog will be displayed stating *Sent OK*. Select *OK*, and the uploaded parameters will be displayed with the default white back ground.
- Note: To disable the fault dialout, select the appropriate parameter; ensure that the check is removed from the check box. Select *OK* in the *Alarm Dialout Configuration* dialog box. On the *Configuration* screen, select the *Upload to MC* option. On display of the *Sent OK* message, select *OK*.

9.7 Monitor Calls

The call monitor provides the operator with a facility to accept incoming telephone calls from an IMC/W2 in the event of alarm conditions (operator configurable limits) and fault conditions. When a call is received by the monitoring calls facility, the information displayed details any fault or alarm condition, date and time the details were received, the serial number, and meter / site ID of a specific IMC/W2. Several IMC/W2's may be configured to dial the same PC in the event of an alarm or fault condition.

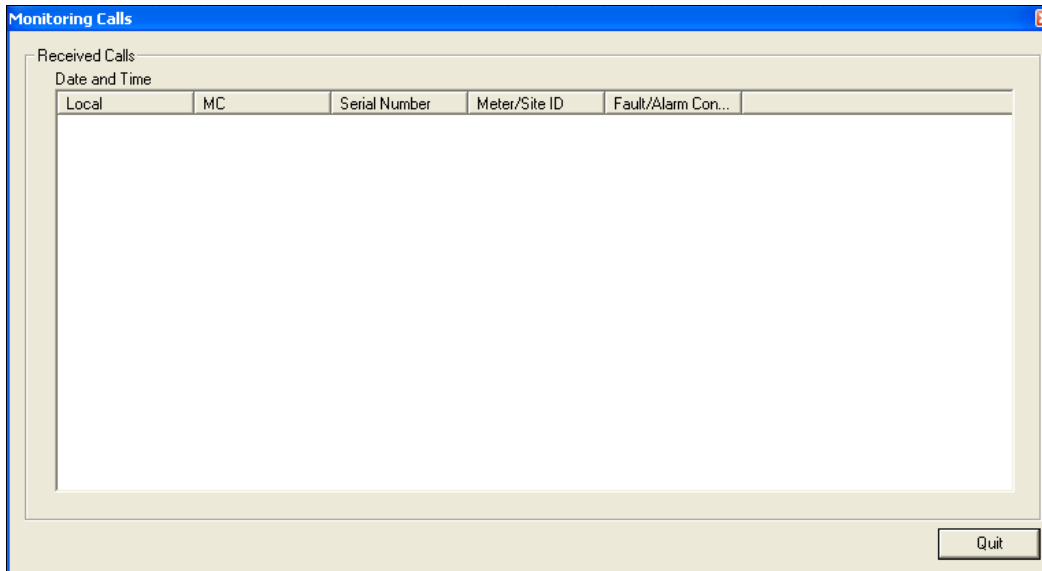


Figure 26 - Monitoring Calls Screen

The set up procedure (entering of telephone numbers and specifying the dialout parameters) can be carried out directly; however the actual call monitor facility requires remote communication (via modem). Therefore this procedure assumes that the IMC/W2 is connected to an intrinsically safe barrier between the IMC/W2 and the PC in the non-hazardous area; in addition the steps outlined below assume that no previous connection has been made with the IMC/W2 in this period.

To setup the call monitor facility:

- Ensure that the IMC/W2 is connected to the Dresser Micro Modem (ensure that all required safety tests have been carried out, see section [3 \(Safety\)](#)), and the PC modem is installed.
- Locate and run the icon created on the desktop during the installation process. Alternatively select the *MC UT* icon from the *MCUT* folder in the *Start, Programs* menu.
- Once either icon has been selected, the *Welcome* screen will be displayed. Select the *Configuration* tab and the *Configuration* screen will be displayed.
- From the *Configuration* screen, select the *Use Modem To Connect* option. Ensure that a check is displayed within the appropriate check box.
- Select the *UT Comms Settings* option. The *UT Comms Settings* screen will be displayed.
- From the *UT Comms Settings* dialog, select the appropriate modem (PC modem) from the *Modem* drop down selection box. Select the *Configure Modem* option; ensure that the modem is configured as described in section [6.10 \(UT Comms Settings\)](#). Once the modem configuration setup is complete, select *O* in the modem connections preferences dialog.
- From the *Modem Settings* dialog box, select *OK*.
- From the *Configuration* screen, select the *Connect with MC* option. The *Telephone Number* dialog box will be displayed.
- Select the drop down selection box within the *Telephone Number* dialog. Enter the telephone number of the Dresser Micro Modem (i.e. that which the IMC/W2 is connected to). (During subsequent use of the modem facility the drop down selection box can be selected and the previously entered telephone numbers will be displayed as a possible selection. Note: The drop down selection box will always display a blank entry).
- Select *OK*. The communication process will begin.
- Once complete, a dialog box will be displayed stating that *Configuration Downloaded OK*. Select *OK*.
- Select the *Faults & Alarms* tab. The *Faults & Alarms* screen will be displayed.
- Select the *Fault Dialout Settings* option. Ensure that the required parameters are checked on the *Faults Dialout Configuration* screen (see section [9.3 \(Fault Dialout Settings\)](#)).
- Ensure that the correct telephone number is displayed within the *Telephone Number* text box. This should be the telephone number that the PC modem is connected to (i.e. the telephone number that the IMC/W2 should dialout to). Select *OK*.
- Select the *Alarm Dialout Settings* option. Ensure that the required parameters are checked on the *Faults Dialout Configuration* screen (see section [9.6 \(Alarm Dialout Settings\)](#)).
- Ensure that the correct telephone number is displayed in the *Telephone Number* text box. This should be the telephone number that the PC modem is connected to (i.e. the telephone number that the IMC/W2 should dialout to). Select *OK*.

- Any parameter changes will need to be uploaded to the IMC/W2. Select the *Configuration* tab.
- Select *Upload to MC*. The communication process will begin.
- Once complete a dialog will be displayed stating *Sent OK*. Select *OK*.

To activate the call monitor facility:

- Note: The steps outlined in this process assume that the steps outlined in the previous section, explaining how to *setup the call monitor facility*, have been followed.
- Select the *Faults & Alarms* tab. The *Faults & Alarms* screen will be displayed.
- Select the *Monitor Calls* option. A dialog box will be displayed stating *Please Select An Existing File to add to or a new file to write the calls to*, select *OK*. The *Save As* dialog box will be displayed.
- Determine the location in which the monitor calls file is to be saved.
- Enter the desired file name that the monitor calls file is to be saved to, and select *Save*.
- The *Monitoring Calls* screen will be displayed.
- The MCUT is now in *standby* mode and ready to accept incoming calls from any IMC/W2 that is configured to dial the appropriate telephone number of that PC.
- When an incoming call is detected, the MCUT will accept the call and the relevant details will be displayed in the call monitor dialog.

The IMC/W2 and the dialout facility:

- When the IMC/W2 is configured to dialout in an alarm or fault condition (setup procedure outlined above) several messages may be displayed on the LCD. This may include the type of alarm, type of fault, and *dIAL Out*.
- The *dIAL Out* message on the LCD indicates that the call process has begun.
- The IMC/W2 will continue to dialout until a successful call has been received by the PC. No further calls will be made in this period unless a new fault / alarm condition arises. If a fault / alarm condition is cleared but the fault / alarm registers have not been cleared (via the *Clear Occurred Faults* and *Clear Occurred Alarms* options within the *Faults & Alarms* screen, or by pressing the selector button on the IMC/W2 when the *CLr FLt* message is displayed on the LCD (fault register only)) no new calls will be made for that fault / alarm.

10 Advanced Screen

The *Advanced* screen contains up to 6 options (model dependant); these are used less frequently than those shown on other screens. Note: If using the modem to connect, the *Prover Mode* option will be disabled.

It is possible to change the password and advanced password from this screen, test the pulse outputs, configure the trim table settings, test the accuracy of the meter via the *Prover Mode* option and set unit for External Power (including connection of the Dresser Micro Generator™) or Digital Input/Tamper or Digital Output / Volume Consumption.

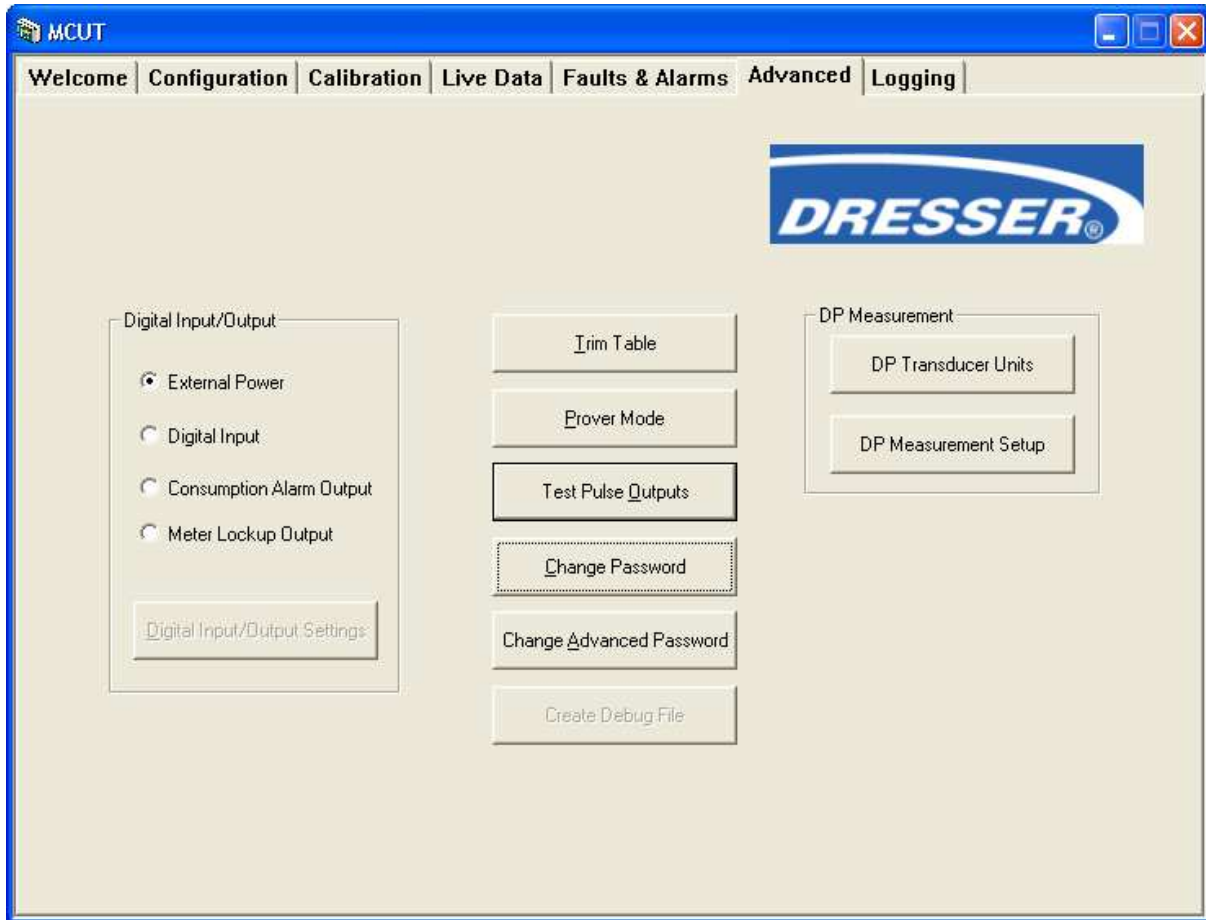


Figure 27 - Advanced Screen (DP-version shown)

To display the advanced screen:

- From the MCUT select the *Advanced* tab. The Advanced screen will be displayed.
- Note: The options available on this screen depend on the model and configuration of the IMC/W2. If a required option is not available please contact your Dresser Representative for further details.

10.1 Trim Table

The *Trim Table* option provides the facility to improve the meter accuracy characteristics for low flow rates. Trim table settings are provided in accordance with manufacturer guidelines for specific meters. Additionally, the operator is able to configure a User Defined Trim Table. The advanced password is required if the *Trim Table* settings are to be configured.

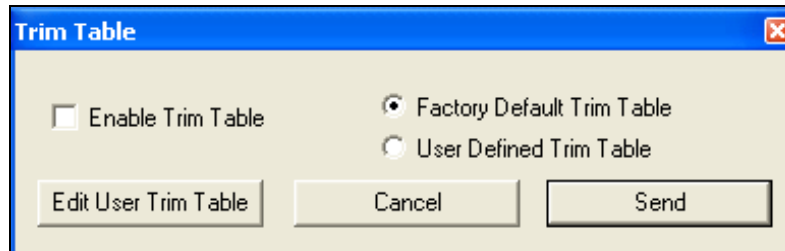


Figure 28 - Trim Table Screen

To enable the trim table facility:

- From the *Advanced* screen select the *Trim Table* option. The *Trim Table* screen will be displayed.
- Select the *Enable Trim Table* parameter; ensure that a check is displayed in the *Enable Trim Table* parameter check box.
- Select the *Send* option. Enter the advanced password and select *OK*, otherwise select *Cancel*.
- The new details will be uploaded to the IMC/W2. On completion a dialog box will be displayed stating that *Trim Table Enabled and Sent*, select *OK*. The *Advanced* screen will be displayed.

To enable a user defined trim table to enable the accuracy characteristics of the meter correction as specific by the operator:

- From the *Advanced* screen select the *Trim Table* option. The *Trim Table* screen will be displayed.
- Ensure that the *Enable Trim Table* parameter is checked.
- Select the *User Defined Trim Table* option.
- Select the *Send* option. Enter the advanced password and select *OK*, otherwise select *Cancel*.
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating that *Trim Table Enabled and Sent*, select *OK*. The *Advanced* screen will be displayed.

To edit user trim table to configure the accuracy characteristics of the meter correction:

- From the *Advanced* screen select the *Trim Table* option. The *Trim Table* screen will be displayed.
- Ensure that the *Enable Trim Table* parameter is checked.
- Ensure that the *User Defined Trim Table* option is selected.
- Select the *Edit User Trim Table* option. Enter the advanced password and select *OK*, otherwise select *Cancel*. The *Trim Table Setup* screen will be displayed.
- In the *Trim Table Setup* screen, the meter type and size are displayed. If this is different from the meter selected in the *Volume Configuration* screen (accessed via the *Configuration* screen), this should be changed. See section [6.3 \(Volume Configuration\)](#) for further details.
- Note: Q_{max} is determined by the meter type and size selected. Select the *No.Entries* text box and enter the desired number of entries for the trim table. The new value will be implied as the value entered will be reflected in the number of *% of Q_{max}* and *Correction Factors* text boxes enabled on the *Trim Table Setup* screen. The acceptable number of entries allowed is between 1 and 16 inclusive.
- Select *% of Q_{max}* text box 1, enter the desired value. The acceptable range is between 1 and 10. Subsequent entries (up to 16 allowable) must be less than the previous value, but more than the subsequent value. For example see Figure 29 on Page 61 (*Trim Table Setup Screen*).
- Select the *Correction Factor* text box 1 and enter the desired value. The acceptable range is between 0.5 and 1.5 for all *Correction Factor* text boxes. The default *Correction Factor* value is equal to 1 (i.e. no correction is performed). Enter all desired values in all *Correction Factor* text boxes.
- Select the *Save As User Defined* option. Once saved, a dialog box will be displayed stating *Trim Table Saved*, select *OK*. The trim table settings need to be sent to the IMC/W2 via the *Trim Table* screen.
- Note: It is possible to save *Trim Table Settings* for each meter type and size, providing the settings are saved when entered. It is then possible the recall these settings.

- From the *Trim Table* screen, ensure that the *User Defined Trim Table* option is selected and select the *Send* option. Enter the advanced password and select *OK*, otherwise select *Cancel*.
- The new details will be uploaded to the IMC/W2. A dialog box will be displayed stating that *Trim Table Enabled and Sent*, select *OK*. The *Advanced* screen will be displayed.
- Note: Once the *User Defined Trim Table* has been sent to the IMC/W2 and the *Trim Table Enabled and Sent* dialog box has been displayed and accepted, the *Trim Table* screen will display the *Factory Default Trim Table* option as selected. It should be noted that the *User Defined Trim Table* has been sent to the IMC/W2, even though the *Trim Table* screen may suggest otherwise.

		% of Qmax	Correction Factors
No. Entries	16	1 10	1
Meter Type	Series B	2 8	1
Meter Size	3M	3 6	1
Qmax	3000 ft ³ /h	4 4	1
		5 3.5	1
		6 3	1
		7 2.66	1
		8 2.33	1
		9 2	1
		10 1.75	1
		11 1.5	1
		12 1.25	1
		13 1	1
		14 0.75	1
		15 0.5	1
		16 0.25	1

Save As User Defined

Cancel

Figure 29 - Trim Table Setup Screen

10.2 Prover Mode

The *Prover Mode* facility provides the operator a means of testing the accuracy of the output signals and verifying the volume accumulation. The real time generation of output pulses (of highest priority for the microprocessor) are at least 10 times shorter than the pulses used in *normal operation*, hence a reduced test time. When in *Prover Mode* the corrected and uncorrected pulses are available on both the telemetry output and via the serial port.

It is possible to enter *Prover Mode* via 2 methods, namely the MCUT (process described below) and via cable (Prover cable part number 057148-000). Please contact your Dresser Representative for further details regarding the cable method of invoking *Prover Mode*.

As soon as *Prover Mode* is entered via the MCUT the pressure and temperature readings are taken, these values are used for the duration of this mode. The settings within the IMC/W2 (corrected and uncorrected volumes and residuals etc) are saved; when *normal operation* is resumed these values are retrieved. In addition the settings of the corrected and uncorrected pulse outputs and corrected and uncorrected volume display multipliers can be changed to suit the needs of the *Prover Mode* without changing the configuration used during *normal operation*.

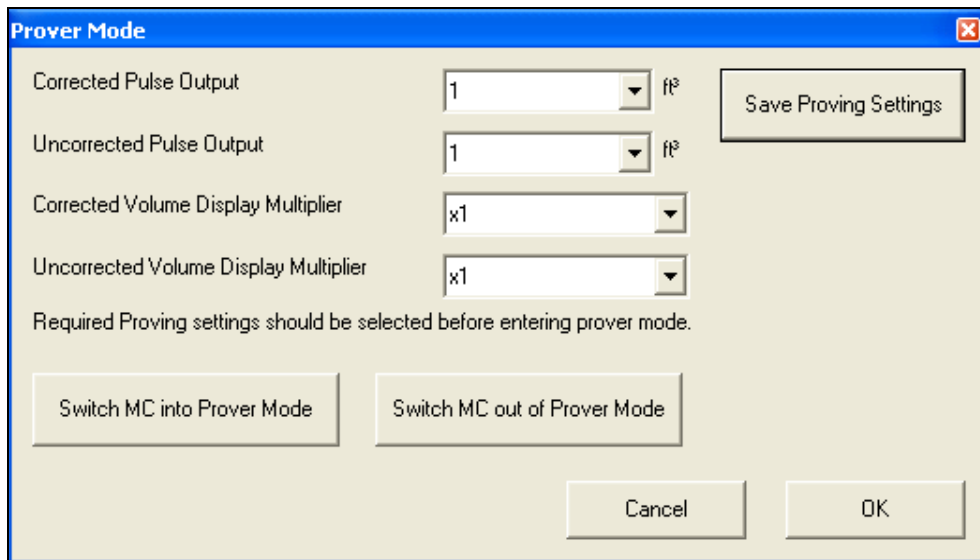


Figure 30 - Prover Mode Dialog

To set the IMC/W2 into Prover mode:

- From within the *Advanced* screen select the *Prover Mode* option. The *Prover Mode* dialog will be displayed.
- Note: The duration in which the IMC/W2 is set into *Prover Mode* is 60 minutes, this value is not editable. However it is possible to switch the IMC/W2 out of *Prover Mode* at any time.
- Select the *Corrected Pulse Output* drop down selection box. Select the desired value.
- Select the *Uncorrected Pulse Output* drop down selection box. Select the desired value.
- Select the *Corrected Volume Display Multiplier* drop down selection box. Select the desired value.
- Select the *Uncorrected Volume Display Multiplier* drop down selection box. Select the desired value.
- The new parameters will need to be uploaded to the IMC/W2. Select the *Save Proving Settings* option.
- On completion a dialog will be displayed stating that *New Proving settings sent successfully*, select *OK*. The *Prover Mode* screen will be displayed.
- From within the *Prover Mode* screen select the *Switch MC into Prover Mode* option. A dialog will be displayed informing the operator of the duration of the (1 hour). To continue select *OK*, otherwise select *Cancel*.
- Once *Prover Mode* has been entered a dialog will be displayed stating *Prover Mode Entered OK*. Select *OK*.
- The LCD on the IMC/W2 will display *ProvE* followed by the remaining duration (in minutes) of *Prover Mode*.
- Once complete the IMC/W2 will switch out of *Prover Mode* and *normal operation* will resume.

To switch the IMC/W2 out of Prover mode:

- From within the *Advanced* screen select the *Prover Mode* option. The *Prover Mode* dialog will be displayed.
- Select the *Switch MC out of Prover Mode* option. A dialog will be displayed stating *Prover mode successfully cancelled*, select *OK*. The *Prover Mode* screen will be displayed.
- Normal operation will resume, *ProvE* will no longer be displayed on the LCD on the IMC/W2.
- From within the *Prover Mode* dialog select *OK*, the *Advanced* screen will be displayed.

10.3 Test Pulse Outputs

The MCUT provides a *Test Pulse Outputs* facility. This allows a verification of the corrected and uncorrected pulse output connections that are used for either telemetry and / or proving purposes. A total of 30 pulses are generated at the pulse width specified within the *Volume Configuration* dialog (accessed via the *Configuration* screen). The activation of the test pulse outputs facility will not cause any disruption to the metered gas; volumes recorded by the meter will be added to the corrected and uncorrected totals, in addition the test pulses produced will be added to the total number of pulses generated. The operator is informed of the test pulse output conditions on selection of the *Test Pulse Outputs* option.

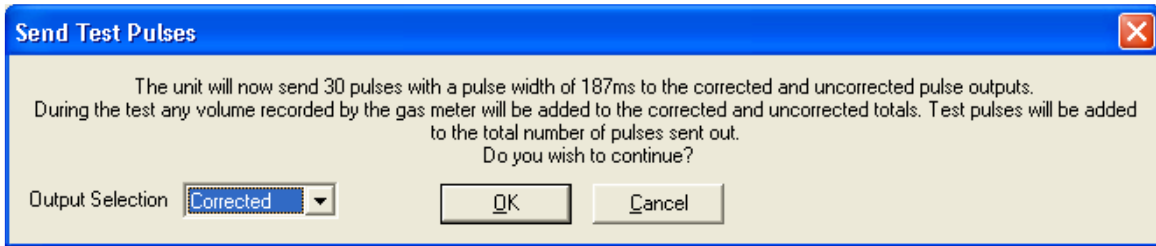


Figure 31 - Send Test Pulses Screen

Note: Firmware versions 1.93 and newer allow the user to choose between corrected and uncorrected pulse outputs.

To activate the test pulse output facility:

- From the *Advanced* screen select the *Test Pulse Outputs* option. The *Send Test Pulses* screen will be displayed.
- The operator will be asked to confirm if it is OK to continue. If appropriate select *OK*, otherwise select *Cancel*.
- Enter the advanced password and select *OK*, otherwise select *Cancel*. A dialog will be displayed stating *Test pulse mode entered successfully*. Select *OK*.
- The LCD on the IMC/W2 will display PULSES. The *Advanced* screen will be displayed.
- The output pulses will be generated. On completion of the test pulse outputs facility *normal operation* will resume.

10.4 Change Password

All password protected parameters are those that, when changed, will affect the customer's bill. The default password is the number 0. Any new password must be numerical and between 1 and 8 digits long.

To change the password:

- From the *Advanced* screen select the *Change Password* option, the *Change Password* dialog will be displayed.
- Select the *Existing Password* text box and enter the existing password. The factory default password is the number 0.
- Select the *New Password* text box and enter the desired new password (must be numerical and between 1 and 8 digits long).
- Select the *Verify Password* text box and verify the new password.
- Select the *OK* option. A dialog box will be displayed stating *Password changed successfully*. Select *OK*. The *Advanced* screen will be displayed.

10.5 Change Advanced Password

All features protected by the *Advanced Password* are those related to the *Trim Table*. The default *Advanced Password* is the number 0. Any new password must be numerical and between 1 and 8 digits long.

To change the advanced password:

- From within the *Advanced* screen select the *Change Advanced Password* option, the *Change Advanced Password* dialog will be displayed.
- Select the *Existing Password* text box and enter the existing password. The factory default password is the number 0.
- Select the *New Password* text box and enter the desired new password (must be numerical and between 1 and 8 digits long).
- Select the *Verify Password* text box and verify the new password.
- Select the *OK* option. A dialog will be displayed stating *Password changed successfully*. Select *OK*. The *Advanced* screen will be displayed.

10.6 External Power or Digital Input/Output selection

Two connectors in Terminal Block TB1 i.e. *Not marked* and *GND* could be configured as external power input or *Digital Input / Tamper Alarm* or *Digital Output / Volume Consumption Alarm* (Figure 27 on page 59).

10.6.1 External Power

Two connectors in Terminal Block TB1 i.e. *No marked* and *GND*, are configured by default as external power input. It means that voltage from 5V to 6V could be supplied to power the unit.

Note: When connecting Dresser Micro Generator™ be sure to set this selection i.e. *External Power*.

10.6.2 Digital Input

If *Digital Input* is selected on *Advanced* screen (Figure 27 on page 59) from *Digital Input/Output* option then window presented in Figure 32 appears.

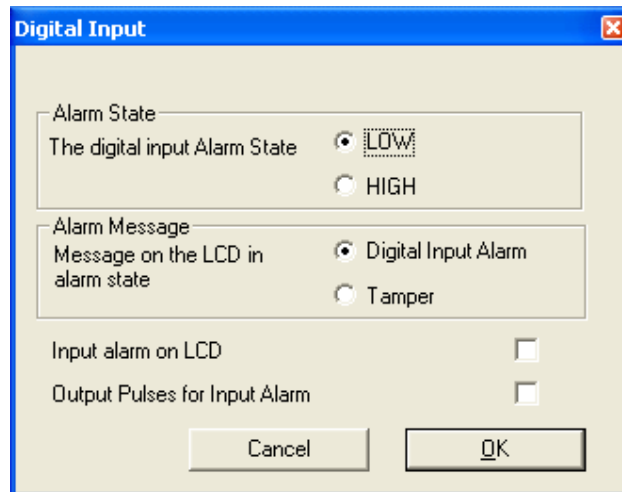


Figure 32 – Digital Input Screen

There are four selections:

- Voltage level for input alarm state, i.e. **LOW** or **HIGH**
- Alarm description that appears on *Live Data* screen, in *Audit Log*, *Configuration Summary* and *Report*. Depending on this selection, *d_In_AL* or *tAnnPEr* can appear on LCD.
- Select whether or not alarm message will appear on LCD.
- Select whether or not an input alarm will generate fault pulses.

If a *Digital Input / Tamper Alarm* occurs, it is shown on the *Live Data* screen (Present and Occurred) and is registered in the *Audit Log*.

10.6.3 Consumption Alarm Output

The *Consumption Alarm Output* facility provides digital signal i.e. HIGH or LOW signal level on digital output terminal. If *Maximum Daily Consumption* of gas is reached than *Alarm State* is set for digital output. Refer to Figure 33; operator could set value of *Maximum Daily Consumption*, *Start Time for Daily Billing* and the signal level in *Alarm State*. Operator could also enable or disable *Consumption Alarm Output* facility.

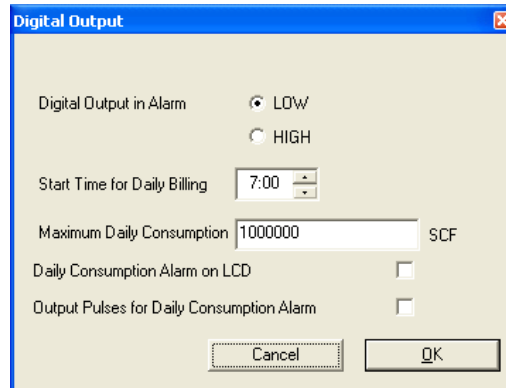


Figure 33 – Consumption Alarm Output Screen

If *Maximum Daily Consumption* is reached then:

- *Alarm State* is set on digital output terminal.
- Daily Consumption Alarm is set in *Live Data* screen,
- *vol_AL* is indicated on LCD if selected,
- Fault Pulse is generated on Output Pulse if selected.

Daily Consumption Register is always reset for Start Time for Daily Billing.

Depending from selection in Customize LCD screen the following parameters could be presented with abbreviated description on LCD:

- Accumulated Corrected Volume current day (Cd),
- Accumulated Corrected Volume previous day (Pd),
- Accumulated Corrected Volume current month (Co),
- Accumulated Corrected Volume previous month (Po),
- Highest daily volume in the current month (Ch),
- Highest daily volume in the previous month (Ph),
- Date when it happened mm_dd_yy (blinking dot).

Date when it happened is the last date when Daily Maximum Consumption was reached.

10.7 DP Measurement

'DP Measurement' units and settings are only active for DP-version Micro Correctors. These settings will only affect differential pressure testing and results.

10.7.1 DP Transducer Units

Select 'DP Transducer Units' and the following screen appears. Use the drop-down menu to select between imperial (in WC) and metric (mbar) units. When finished press 'OK'.

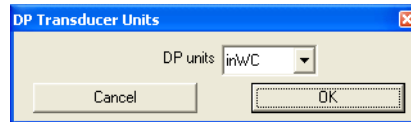


Figure 34 – DP Transducer Units Screen

10.7.2 DP Measurement Setup

Select 'DP Measurement Setup' and the following screen appears. Select among the three models for DP analysis: *Dresser's Differential Test Acceptance Calculator (DTAC) software*, *Learn method 1*, or *Learn method 2*. Both learn methods achieve more accurate DP data by gathering reference values for a specific meter installation. These learned parameters are then used in the mathematical model.



Figure 35 – Meter Diagnostic Setup/Values Screen

- *DTAC Software Only* - This mathematical model will qualify the results of DP testing based on the following parameters: line pressure (measured), flow rate (measured), specific gravity (configured) and meter size/type (configured). Selection of "DTAC Software Only" immediately starts full meter diagnostics, including DP meter alarm.
- *Learn method 1* - This learning method is available for selection if the meter size and type is included in the DTAC software. During the learning period, the DTAC software is used to analyze Meter DP fault and Meter Lockup fault. If the learning period is successfully completed, then all meter diagnostics are performed based on learned mathematical model parameters. If the learning period is unsuccessful, then the DTAC software is used for full meter diagnostics (including meter DP alarm).
- *Learn method 2* - This learning method is available for selection if the meter data is not included in DTAC software, or there is a reason not to use DTAC. If the learning period is successfully completed, then all meter diagnostics are performed based on learned mathematical model parameters. If the learning period is unsuccessful, then DP diagnostics are not available.
- Once a learning method is chosen, press 'Start Meter Learning Period' to initialize the analysis model.
- Learning can be re-started at anytime; however, if the previous learning period was successfully completed, the MCUT will show a warning and ask for confirmation to continue.

11 Logging Screen

The MCUT provides audit and data logging facilities. The audit log provides a record of 32 (maximum) changes to parameters that will affect the billing. The data log provides approximately 6000 data log records for 1.89 or newer firmware versions, if logging of 10 parameters is selected. The exact number is shown on Logging Setup screen.

Both the audit and data logs are saved as CSV files (comma-delimited). This enables easy import into spreadsheets such as MS Excel. Once imported into the spreadsheet, the data can be manipulated as required.

The *Logging* screen contains 3 options which enable the operator to configure the logging setup of the data log, download the data log and download the audit log.

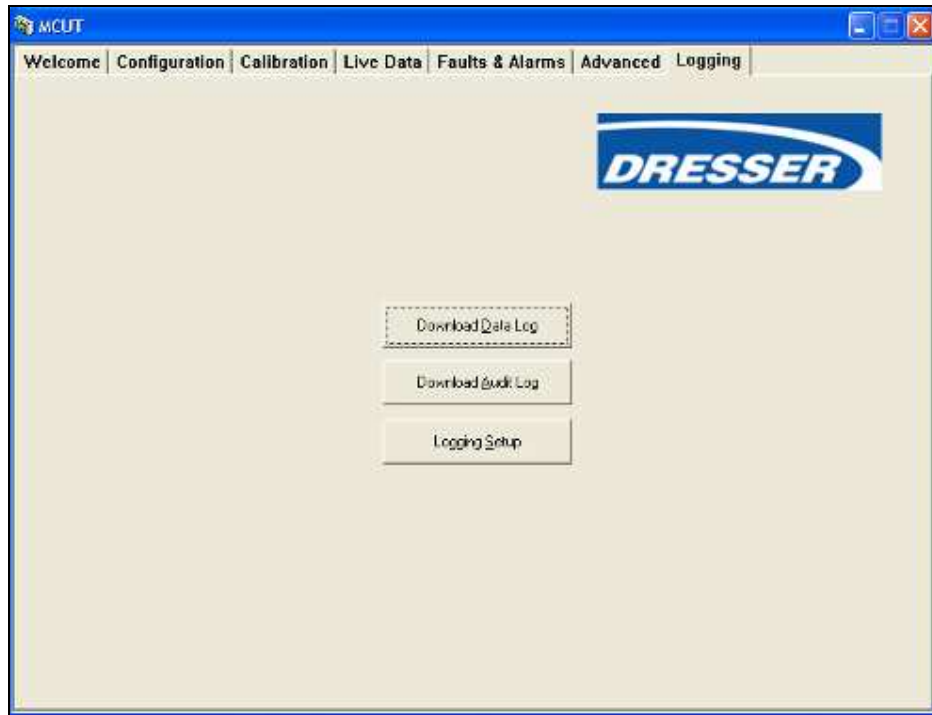


Figure 36 - Logging Screen

To display the logging screen:

- From the MCUT select the *Logging* tab. The *Logging* screen will be displayed.
- Note: The options available on this screen depend on the model and configuration of the IMC/W2. If a required option is not available please contact your Dresser Representative for further details.

11.1 Logging Setup

The *Logging Setup* dialog is divided into 4 sections; the *Logged Parameters*, *Log1*, *Log2*, and *Log3*; from within these sections the operator is able to configure what data is logged and the frequency of these logs.

The screenshot shows the 'Logging Setup' dialog box. On the left, under 'Logged Parameters', there is a list of 20 parameters, each with a checked checkbox: Corrected Volume, Uncorrected Volume, Correction Factor, Uncorrected Volume Under Fault, Average Corrected Flow Rate, Peak Corrected Flow Rate, Supercompressibility, Minimum Pressure, Maximum Pressure, Average Pressure, Ending Pressure, Minimum Temperature, Maximum Temperature, Average Temperature, Ending Temperature, and Battery Voltage. Below this list are two unchecked checkboxes: Flow Weight Pressure and Flow Weight Temperature. Under 'Flow Weighted Settings', there is an 'Empty Value' field set to '0' and a 'Flow Weight Empty Value' dropdown menu set to 'User defined'. On the right, there are three sections for 'Log1', 'Log2', and 'Log3'. Each section has radio buttons for 'Minutes', 'Hour', 'Daily', and 'Monthly'. Log1 has 'Hour' selected, with a dropdown set to '1' and a spinner set to '0' labeled 'Minutes After Hour', and a 'Logs Required' field set to '514' with a 'Maximum 3798' label. Log2 has 'Daily' selected, with a dropdown set to '1' and a 'Time of Day' field set to '6:00 AM', and a 'Logs Required' field set to '514' with a 'Maximum 3284' label. Log3 has 'Monthly' selected, with a 'Day of Month' field set to '1' and a 'Time of Day' field set to '6:00 AM', and a 'Logs Required' field set to '514' with a 'Maximum 2770' label. At the bottom of the dialog are 'Upload Logging Setup' and 'Cancel' buttons.

Figure 37 – Logging Setup Screen

The logged parameters available for selection include:

- Corrected Volume.
- Uncorrected Volume.
- Correction Factor.
- Uncorrected Volume Under Fault.
- Average Corrected Flow Rate.
- Peak Corrected Flow Rate.
- Supercompressibility.
- Minimum Pressure.
- Maximum Pressure.
- Average Pressure.
- Ending Pressure.
- Minimum Temperature.
- Maximum Temperature.
- Average Temperature.
- Ending Temperature.
- Battery Voltage
- Average Monitor Pressure. (External monitor pressure units only)
- Minimum Monitor Pressure. (External monitor pressure units only)
- Maximum Monitor Pressure. (External monitor pressure units only)
- End Monitor Pressure. (External monitor pressure units only)

The logging frequency is distributed over a maximum of 3 different logging intervals; these are described as *Log1*, *Log2* and *Log3* within the *Logging Setup* dialog. For the purpose of the monthly data log all months are assumed to have a maximum of 28 days. The default logged parameters are: corrected volume, uncorrected volume, correction factor, uncorrected volume under fault, average pressure, average temperature, average corrected flow rate, peak corrected flow rate and supercompressibility.

If the configuration of *Logged Parameters* is changed the number of logs available will also change; by reducing the number of parameters to be logged the number of available logs recorded will increase. Any change to the maximum number of logs available is displayed within the relevant section(s) within the *Logging Setup* dialog e.g. *Maximum 523*.

To display the logging setup dialog:

- From the MCUT select the *Logging* tab. The *Logging* screen will be displayed.
- From the *Logging* screen select the *Logging Setup* option. The *Logging Setup* dialog will be displayed.

11.1.1 Logged Parameters

The *Logged Parameters* are operator configurable; by default all available parameters are *switched on*, if the details of a parameter are not required within the data log, it is possible to switch it off.

To switch off unwanted logged parameters:

- From the *Logging* screen select the *Logging Setup* option. The *Logging Setup* screen will be displayed.
- From the *Logged Parameters* section, select the appropriate parameter(s) whose details are not required within the data log. Ensure that the check is removed from the appropriate check box.
- Select the *Upload Logging Setup* option.
- **Note: By changing the configuration of the logged parameters any existing log entries will be cleared from the data log. Therefore it is recommended that any existing data log is downloaded prior to any changes to the data log configuration.**
- If it is not required to download the existing data log select the *Upload Logging Setup*, otherwise select *Go To Data Log Download Screen* or *Cancel*.
- On completion a dialog box will be displayed stating *New Logging Settings Successfully Uploaded*. Select *OK*. The *Logging* screen will be displayed.

To switch on required logged parameters:

- From the *Logging* screen select the *Logging Setup* option. The *Logging Setup* screen will be displayed.
- From the *Logged Parameters* section select the appropriate parameter(s) whose details are required within the data log. Ensure that a check is displayed in the appropriate check box.
- Select the *Upload Logging Setup* option.
- **Note: By changing the configuration of the logged parameters any existing log entries will be cleared from the data log. Therefore it is recommended that any existing data log is downloaded prior to any changes to the data log configuration.**
- If it is not required to download the existing data log select the *Upload Logging Setup*, otherwise select *Go To Data Log Download Screen* (to download the data log) or *Cancel*.
- On completion a dialog will be displayed stating *New Logging Settings Successfully Uploaded*. Select *OK*. The *Logging* screen will be displayed.

11.1.2 Log1, Log2 and Log3

The method for changing the *Logging Frequency* is the same for *Log1*, *Log2* and *Log3*; therefore the methods described below apply to all 3 logging frequencies (Note: to change *Log1* the settings must be changed within the *Log1* section, *Log2*, the *Log2* section and *Log3*, the *Log 3* section).

To specify the logging frequency:

- From the *Logging* screen select the *Logging Setup* option. The *Logging Setup* screen will be displayed.
- From the appropriate section (*Log1*, *Log2* or *Log3*) select the desired frequency (*Minutes*, *Hour*, *Daily* or *Monthly*).
- Once selected, a more specific selection is required;
 - Minutes – specify how frequent the logs should be taken, acceptable range 1 – 59 (if 2 is selected a log will be taken every 2 minutes).
 - Hour – specify how frequent the logs should be taken, acceptable range 1 – 4, 6, 8, 12. In addition the operator should also specify how many minutes after the hour the log should be taken, accepted range 0 – 59 (if 4 is selected in the first drop down selection box and 53 in the second, the logs will be taken every 4 hours at 53 minutes past the hour).
 - Daily – specify the *Time of Day* that the logs should be taken, acceptable range 0:00 – 23:00.
 - Monthly – specify the *Day of Month*, accepted range 1 – 28. In addition, the operator should specify the *Time of Day*, acceptable range 0:00 – 23:00 (if 28 is selected in the first selection box and 23:30 in the second, a log will be taken on the 28 day of every month at 23:30).
- Repeat for each *Log* as required.
- Select the *Upload Logging Setup* option.
- **Note: By changing the configuration of the logged parameters any existing log entries will be cleared from the data log. Therefore it is recommended that any existing data log is downloaded prior to any changes to the data log configuration.**
- If it is not required to download the existing data log select the *Upload Logging Setup*, otherwise select *Go To Data Log Download Screen* (to download the data log) or *Cancel*.
- On completion a dialog will be displayed stating *New Logging Settings Successfully Uploaded*. Select *OK*. The *Logging* screen will be displayed.

Note: If any parameters or logging frequencies are changed, the user will be prompted with the following warning screen.

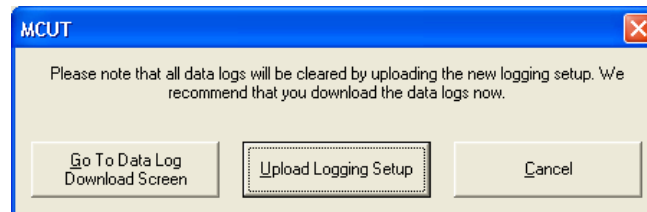


Figure 38 – 1st Warning Screen

If “Upload Logging Setup” is chosen, the user will again be prompted with the following 2nd warning screen.



Figure 39 – 2nd Warning Screen

11.2 Download Data Log

When downloading the data log it is possible to select the specific data that is to be retrieved; which log to be downloaded, the range of data for that log, and the manner in which the logged data should be displayed within the log file. The *Download Data Log* dialog is divided into 5 sections; *Log1*, *Log2*, *Log3*, *Options* and *Download Volume Units* section.

The screenshot shows a window titled "Download Data Log" with three sections for Log1, Log2, and Log3. Each section contains the following information:

Log	Logging Frequency	Logs Acquired	Logs Available	Time/Date of First Log Available	Time/Date of Last Log Available	Download Logs From	Download Logs To
Log1	Every 1 Minutes	1221	1221	12:21:00 PM 06/27/2005	8:41:00 AM 06/28/2005	12:21 PM	06/27/05
Log2	Every 2 Minutes	610	610	12:22:00 PM 06/27/2005	8:40:00 AM 06/28/2005	12:22 PM	06/27/05
Log3	Every 4 Minutes	305	305	12:24:00 PM 06/27/2005	8:40:00 AM 06/28/2005	12:24 PM	06/27/05

Below the log sections are the following options:

- Cumulative/Index Read Log
- Consumption Per Log
- Download From Last Log
- Reverse Chronological
- Chronological

Downloaded Volume Units:

- ft³
- m³
- m³
- MCF
- MMCF

Buttons at the bottom include "Refresh Data", "View Last Log", and "Close".

Figure 40 - Download Data Log Screen

11.2.1 Download Log1, Log2 and Log3

The method for downloading the data logs is the same for *Log1*, *Log2* and *Log3*; therefore the methods described below apply to all 3 logging frequencies (Note: to download *Log1* the download options must be changed within the *Log1* section, *Log2*, the *Log2* section and *Log3*, the *Log 3* section). A *Refresh Data* option is provided to ensure that the latest time and date of logged entries available for download are displayed to the operator. Once a data log has been downloaded the *View Last Log* option will become available.

To download all available data log entries:

- From within the *Logging* screen select the *Download Data Log* option. The *Download Data Log* screen will be displayed.
- The time and date of the first available log are displayed in the relevant section, along with the time and date of the last available log. By default, all available data logs will be downloaded.
- Select the *Refresh Data* option to ensure that the very latest available log time and date are displayed. If appropriate the read only details associated with each log period will be updated.
- From the appropriate section (*Log1*, *Log2* or *Log3*) select the *Download Log* option. The *Save As* screen will be displayed.
- Select the location where the data log file is to be saved.

- Enter the desired file name that the data log file is to be saved to. A default file name will be displayed which may also be used. Select the *Save* option.
- Once complete a dialog box will be displayed stating *Log File Saved OK*. Select *OK*.

To view a downloaded data log:

- Once downloaded from the MCUT select the *View Last Log* option. The default spreadsheet program used to open CSV files will be launched, and the data log file will open. The data can then be manipulated as required.
- To return to the *Logging* screen select the *Close* option.

Alternatively:

- Open the appropriate data log file (all data log files saved from within the MCUT are of the type *.CSV*) from within the spreadsheet in the usual manner.

11.2.2 Options

Various options are available within the *Download Data Log* dialog in the *Options* section. An explanation of the functionality they offer is provided below. If any of these options are required, they should be selected prior to selection of the appropriate *Download Log* option.

Cumulative / Index Read Log:

- Selection of this option will display the volumes within the data log as per the volumes displayed on the LCD of the IMC/W2.

Consumption Per Log:

- Selection of this option will display the volumes logged within each logging period (i.e. the difference between the new and last volume reading)

Download From Last Log:

- Selection of this option will include only the data log entries that have been logged since the last data log was retrieved.

Chronological and Reverse Chronological:

- Selection of the *Chronological* option will ensure that the data log entries within the data log file are displayed with the oldest entry first. If the *Reverse Chronological* option is selected the data log entries within the data log file will be displayed with the oldest entry last.

11.2.3 Downloaded Volume Units

There is a possibility to present logged corrected and uncorrected volume in different units.

If imperial type of meter was selected then volume is logged in ft³ (CF) and might be presented in m³.

If metric type of meter was selected then volume is logged in m³ and can be presented in either MCF (ft³/1000) or in MMCF (ft³/1000000).

11.3 Download Audit Log

An audit log facility is provided to ensure that all changes to parameters that may affect the customer's billing are recorded. All audit log files saved in the MCUT are of the type *.CSV*. A *Refresh Data* option is provided to ensure that the latest log entry details available for download are included. Once an audit log has been downloaded the *View Last Log* option will become available.

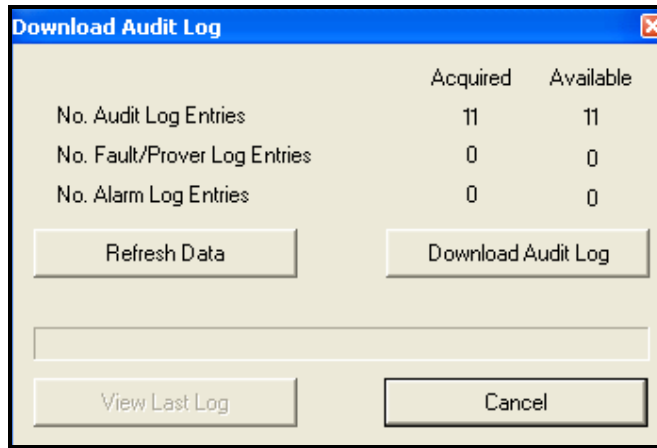


Figure 41 - Download Audit Log Screen

Table 9 – Audit Log Parameters Reference Table

Audit Log Parameter	
Volume Configuration	Meter Type
	Meter Size
	Flow Sense
	Corrected Multiplier
	Uncorrected Multiplier
	Corrected Pulse Output
	Uncorrected Pulse Output
	Pulse Output Allocation
	Pulse Width
	Corrected Volume
	Uncorrected Volume
Uncorrected Volume under Fault	
Corrections Configuration	Temperature Units
	Base Temperature
	Temperature Mode (Fixed or Live)
	Fixed Temperature
	Pressure Units
	Base Pressure
	Atmospheric Pressure
	Fixed Pressure Factor
	Fixed Line Pressure
	Pressure Mode (Fixed or Live)
	Supercompressibility
Fixed Pressure Type (Gauge or Absolute)	
Calibration	Temperature Calibration Offset
	Temperature Calibration Span
	Pressure Calibration Offset
	Pressure Calibration Span
Alarm Settings	High Pressure Alarm Limit
	Low Pressure Alarm Limit
	High Temperature Alarm Limit
	Low Temperature Alarm Limit
	High Flow Rate Alarm Limit
Digital Input/Tamper	
Advanced Options	Trim Table Settings
	Prover Mode
	Test Pulses Output
	Password Change
	Advanced Password Change

NOTE: In addition to these configurable parameters, the audit log will also display faults and alarms that have either occurred or have occurred and been cleared, since the last logging download. The audit log also shows entries for proving activity.

To download the audit log:

- From the *Logging* screen select the *Download Audit Log* option. The *Download Audit Log* screen will be displayed.
- The number of available log entries will be displayed on the screen under the *Available* heading. For operator informational purposes, the available logs are categorized under the following headings; audit log entries, fault / Prover log entries and alarm entries.
- Select the *Refresh Data* option to ensure that the very latest available log entry details are included. If appropriate the read only details associated with each audit log category will be updated.
- Select the *Download Audit Log* option. The *Save As* dialog will be displayed.
- Select the location where the audit log file is to be saved.
- Enter the desired file name that the audit log file is to be saved to. A default file name will be displayed which may also be used. Select the *Save* option.
- Once complete a dialog box will be displayed stating *Log File Saved OK*. Select *OK*.

To view a downloaded audit log:

- Once downloaded from the MCUT select the *View Last Log* option. The default spreadsheet program used to open CSV files will be launched and the audit log file will open. The data can then be manipulated as required.
- To return to the *Logging* screen select the *Cancel* option.

12 Monitor Pressure

IMCW2's with firmware version 1.91 or higher, can be equipped with a second pressure transducer, called Monitor Pressure, in addition to a Line Pressure transducer. This transducer can be absolute or gauge type. Pressure units selected on the Configuration screen must be the same for both the line and monitor transducers (See Chapter 6.4). Value of the monitor pressure is shown on Live Data screen; see Figure 21 on page 48. Values of monitor pressure can be logged in Data Logs. Logging setup (See Chapter 11.1) allows selection of:

- Average Monitor Pressure.
- Minimum Monitor Pressure.
- Maximum Monitor Pressure.
- End Monitor Pressure.

Corrector's firmware senses if Monitor Pressure transducer fails, then a fault is set. This set fault, occurred and present, can be seen on Live Data screen. Pressure Monitor fault is registered in the Audit Log with date & time of this event, and also "Pm FLt" is shown on LCD. Monitor Pressure fault can be selected so that corrector will dialout to specific telephone number in case of this event, look at chapter 9.3.

Monitor Pressure transducer can be recalibrated in one or two points, Refer to Chapter 7.

13 Modem Communications

Note: An intrinsically safe barrier must be installed between a PC in a non-hazardous area and the IMC/W2 in the hazardous area. Please refer to section [3 \(Safety\)](#) for more details. Two types of Dresser modems are recommended: line type *Micro Modem* and GSM/GPRS type *Micro Modem*.

To initialize communications via modem:

- Start the MCUT software.
- Select the *Configuration* tab, the *Configuration* screen will be displayed.
- From the *Configuration* screen, select the *Use Modem To Connect* option. Ensure a check is displayed within the check box.
- Select the *UT Comms Settings* option. The *UT Comms Settings* screen will be displayed.
- From the *Modem* section, select the *Modem* drop down box, and select the appropriate modem (ensure that the PC modem that will be used by the PC to dial out is selected).
- Ensure the modem is configured as specified. Please refer to section [6.10 \(UT Comms Settings\)](#) for further details.
- Note: It is important to specify the correct modem baud rate in the *MC Comms Settings* option while in direct communications (accessed via the *Configuration* screen). This will ensure that the IMC/W2 and modem communicate at the speed specified by the modem. If the incorrect modem baud rate is specified, modem communications will not be possible.
- From the *UT Comms Settings* dialog select the *OK* option.
- From the *Configuration* screen select the *Connect with MC* option. The *Telephone Number* screen will be displayed.
- Enter the telephone number of the Modem that the IMC/W2 is connected to. Select *OK*.
- Once communications have been established, a dialog will be displayed stating *Configuration Downloaded OK*. Select *OK*.
- Continue to configure the IMC/W2 as required. Please refer to the relevant sections above as required.

14 Password Protection

Parameters that are password protected are detailed in Table 10 (*Password Protected Parameters*). If the operator attempts to change a protected password a password dialog will be displayed, the appropriate password should be entered; following a successful password entry the changed parameters will be uploaded to the IMC/W2.

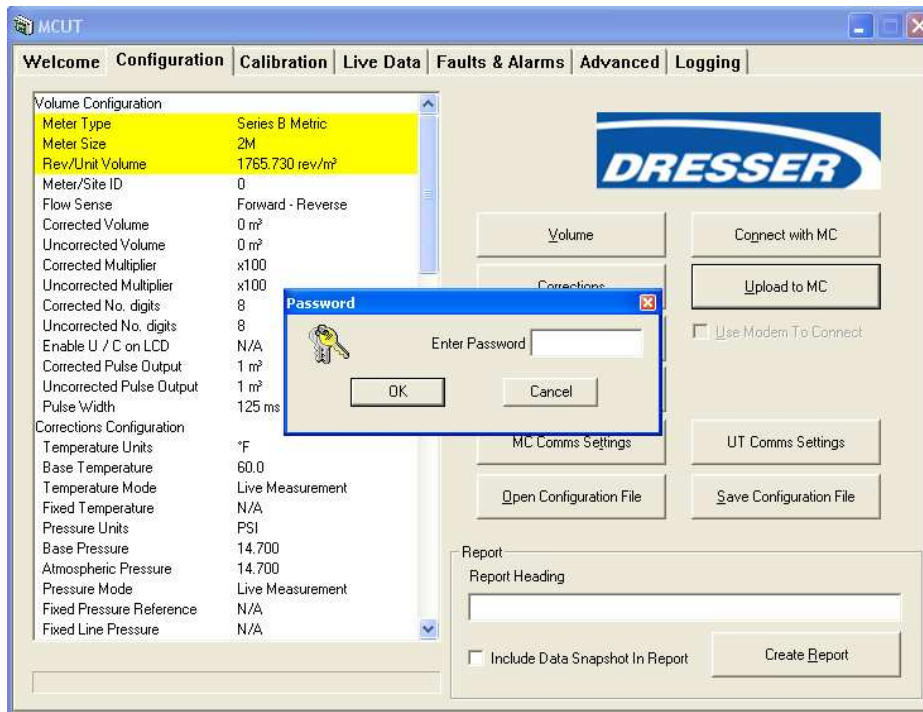


Figure 42 - Password Screen

Table 10 – Password Protected Parameters Reference Table

Password Protected Parameters	
Volume Configuration	Meter Type
	Meter Size
	Flow Sense
	Corrected Multiplier
	Uncorrected Multiplier
	Pulse Output Allocation
	Corrected Pulse Output
	Uncorrected Pulse Output
	Corrected Volume
	Uncorrected Volume
	Clear Uncorrected Volume under Fault Register
Corrections Configuration	Temperature Units
	Base Temperature
	Temperature Mode (Fixed or Live)
	Fixed Temperature
	Pressure Units
	Base Pressure
	Atmospheric Pressure
	Fixed Pressure Factor
	Fixed Line Pressure
	Pressure Mode (Fixed or Live)
	Supercompressibility
	Supercompressibility Mode
	Fixed Pressure Type (Gauge or Absolute)
Calibration	Temperature Calibration
	Pressure Calibration
Other	Trim Table Settings*
	Test Pulse Outputs
	External Power
	Digital Input
	Digital Output
	Password Change
	Advanced Password Change

*Note: Trim Table Settings is protected by *Advanced Password*.

15 Weights and Measures Link Protection

The *Weights and Measures* link protection is provided to meet various legislation requirements. When the *Weights and Measures* link is in place the parameters that it protects (see table 11 ([Weights and Measure Link Protection](#))) are not operator configurable. For further details regarding the setting of the weights and measures link refer to the *Integral Micro Series Volume Corrector with Wiegand Sensor* manual (PH028) as shipped with the IMC/W2. Note: The configuration set up of the IMC/W2 will need to be carried out prior to setting the *Weights and Measures* link.

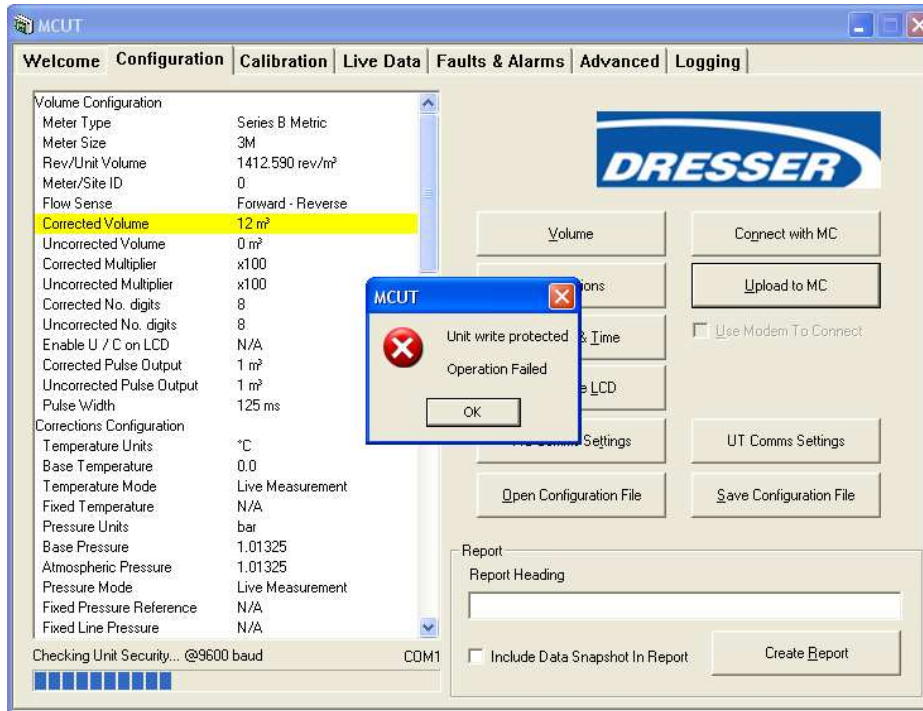


Figure 43 - Weights and Measures Link Protection Screen

If the operator attempts to change a parameter protected by the *Weights and Measures* link, a screen will be displayed (see Figure 43 ([Weights and Measure Link Protection Screen](#))) once the *Upload to MC* option is selected.

Table 11 – Weights and Measures Link Protected Parameters Reference Table

Password Protected Parameters	
Volume Configuration	Meter Type
	Meter Size
	Flow Sense
	Corrected Multiplier
	Uncorrected Multiplier
	Corrected Pulse Output
	Uncorrected Pulse Output
	Corrected Volume
	Uncorrected Volume
	Clear Uncorrected Volume under Fault Register
Corrections Configuration	Temperature Units
	Base Temperature
	Temperature Mode (Fixed or Live)
	Fixed Temperature
	Pressure Units
	Base Pressure
	Atmospheric Pressure
	Fixed Pressure Factor
	Fixed Line Pressure
	Pressure Mode (Fixed or Live)
	Supercompressibility
	Supercompressibility Mode
	Fixed Pressure Type (Gauge or Absolute)
Calibration	Temperature Calibration
	Pressure Calibration
Advanced Options	Trim Table Settings
	Test Pulse Outputs
	External Power
	Digital Input
	Digital Output

16 The IMC/W2 LCD Displayed Messages

The parameters displayed on the LCD of the IMC/W2 can be accessed via the selector push button on the front panel of the IMC/W2. In addition to the parameters listed in section [6.6 \(Customize LCD\)](#) further *messages* are displayed for informational purposes (see table 12 (*LCD Displayed Messages*)). Note: Some of these *messages* are dependent on the configuration of the unit.

Table 12 – LCD Displayed Messages Reference Table

LCD Parameter	Additional Information	Example
Corrected Volume	Maximum 9 digits. The display multiplier and volume units are also displayed.	999999999 _{x100} cu ft
Uncorrected Volume	Maximum 9 digits. The display multiplier and volume units are also displayed	999999999 _{x100} cu ft
Flow Rate	In addition to the flow rate value the volume units will be displayed.	0.0 _{m³}
Correction Factor	Value only.	
Meter Size*	Meter Series, meter size	b 3 mn
Line Pressure	Pressure reading and pressure units displayed.	1.001b
Differential Pressure	Inlet/Outlet meter differential pressure reading units displayed.	00.001 _l
Temperature	Temperature reading and temperature units displayed.	50.1C
Uncorrected Volume Under Fault	Maximum 5 digits. The letters <i>UF</i> are displayed to signify <i>Uncorrected</i> volume under <i>Fault</i> . The display multiplier and volume units are also displayed.	99999UF _{x100} cu ft
Corrected Residual	Maximum 3 digits (and 2 decimal places). The letters <i>Cr</i> are displayed to signify <i>Corrected Residual</i> . The display multiplier and volume units are also displayed.	199.99Cr _{x100} cu ft
Uncorrected Residual	Maximum 3 digits (and 2 decimal places). The letters <i>Ur</i> are displayed to signify <i>Uncorrected Residual</i> . The display multiplier and volume units are also displayed.	199.99Ur _{x100} cu ft
Firmware version	Firmware version followed by <i>Fr</i> .	1.83Fr
Atmospheric Pressure	Atmospheric pressure reading followed by <i>PA</i> .	1.01 PA
Base Pressure	Base pressure reading followed by <i>Pb</i> .	1.01 Pb
Pressure Factor	Pressure factor value followed by <i>PF</i> .	1.00 PF
Supercompressibility	Supercompressibility value followed by <i>Zb</i>	1.002b Zb
Battery Voltage	Indication of battery voltage followed by <i>Ub</i>	5.39 Ub
Current Date	Date is displayed with an underscore separator. MM/DD/YY format.	05_01_03
Current Time	Time is displayed with a dash separator. HH/MM/SS	10-30-59
Test Screen	LCD will display each section (as an 8) individually and all symbols (battery icon, display multiplier and volume units)	
DP Test Screen	Last valid DP test results (Avg DP value, avg flow rate, avg line pressure, avg temp, and date of occurrence) will be displayed with all blinking chevrons on LCD. These values will cycle twice on the screen.	
Max Peak Flow Rate	Maximum peak flow rate will be displayed with all solid chevrons on LCD.	
Units	Explanation	
x0.1	0.1 Display multiplier	
x1	1 Display multiplier	
x10	10 Display multiplier	
x100	100 Display multiplier	
x1000	1000 Display multiplier	
cu ft	Cubic feet	
m ³	Cubic meters	
b	Bar	
P	PSI	
-PA	KPa/cm ²	
-9F	Kgf/cm ²	
l	Inches of Water Column	
nnb	mbar	
P FLt	IMC/W2 has entered the Pressure Fault condition.	
Pm FLt	Monitor Pressure fault	
t FLt	IMC/W2 has entered the Temperature Fault condition.	
VoL FLt	IMC/W2 has entered the Volume Fault condition.	
Int FLt	IMC/W2 has entered the Internal Operation fault condition.	
Lo bAtt	IMC/W2 has entered low battery condition.	
HP AL	High Pressure alarm present.	
LP AL	Low Pressure alarm present.	
Ht AL	High Temperature alarm present.	
Lt AL	Low Temperature alarm present.	
HF AL	High Flow alarm present.	
LF AL	Low Flow alarm present	
d In_AL	Digital Input alarm present	
tAnnPEr	Tamper alarm present	
vol AL	Volume Consumption alarm present	
ProvE XX	IMC/W2 is in Prover mode; remaining minutes will also be displayed.	
ProvE?	A further press of the IMC/W2 selector button will put the IMC/W2 into Prover mode.	
dIAL Out	IMC/W2 has entered dial out mode.	
CLr Flt	Clear fault, a further press of the IMC/W2 selector button will clear any occurred fault and alarm.	
PULSES	IMC/W2 is in test pulse output mode.	
dP FLt	Meter DP Fault	
dP AL	Meter DP Alarm	
dP LOC	Meter Lockup Fault	
OS FLt	Overspeed Fault	

NOTE: If the IMC/W2 is fitted with a Differential Pressure Transducer, the Meter Size location on the LCD will be replaced by the Differential Pressure Value. If the IMC/W2 is fitted with a monitor transducer, the Meter Size location on the LCD will be replaced by the Monitor Pressure value.

Appendix A – Terminology Used

The terminology used in this manual is listed, for quick reference, in Table 13 (*Terminology and Abbreviation Quick Reference Table*); in addition the abbreviations used are described within the body of this manual on the first use in the relevant section. Subsequent instances will be abbreviated.

Table 13 – Terminology and Abbreviation Quick Reference Table

Terminology / Abbreviation	Explanation
MCUT	Micro Corrector User Terminal software
IMC/W2 / Unit	Integral Micro Series Volume Corrector with Magnetic Pickup Volume Input
Select / Selecting	Place the mouse cursor over an item and press the left mouse button.
Title Bar	The title bar displays the name of the main screen / dialog box. These names are used to cross refer throughout this manual.
Tab	The following tab options are available; Welcome, Configuration Calibration, Live Data, Faults & Alarms, Advanced, Logging.
Button / Option	A selectable icon that the operator is required to <i>select</i> . Selection of a button / option will either signify the operator's response (e.g. selecting <i>OK</i> to acknowledge a message) or an operator request (e.g. selecting the <i>Configuration</i> tab to display the <i>Configuration</i> screen). See Figure 44 (<i>Identification Guide</i>).
Screen	When a <i>Tab</i> is selected the associated <i>Screen</i> is displayed. Figure 44 shows the <i>Configuration</i> screen.
Dialog	There are numerous dialogs that may be displayed within the MCUT. These are displayed when selecting a button / option from within a screen. See Figure 44 (<i>Identification Guide</i>); the dialog requires a response from the operator to acknowledge a successful configuration download. In this instance the operator should <i>select</i> the <i>OK</i> option to continue.
Check Box	When a check box is enabled a 'tick' or 'check' is placed in the box. See Figure 44 (<i>Identification Guide</i>); the check box should be enabled if communication to the IMC/W2 is to be carried out via a modem.
Parameter Selection List	The parameter selection list is located on the left hand side of the <i>Configuration</i> screen and contains the list of parameters that are changeable within a dialog (e.g. <i>Volume Configuration</i> dialog). By double clicking an item within the parameter selection list the appropriate dialog (including those from other screens) will be displayed, and where applicable the specific parameter will be highlighted within that dialog. If any parameter is changed it will be highlighted yellow within the parameter selection list until it is <i>Uploaded to MC</i> .
Text Box	A text box is an operator editable field which enables the operator to enter a new value. Figure 44 (<i>Identification Guide</i>) contains a text box which allows the operator to specify a name for a given IMC/W2.
Drop Down Selection Box	The drop down selection box provides the operator with a pre-determined selection of options. To view the options available select the arrow located on the right hand side of the selection box. The available options are then displayed; if required a scroll bar is displayed to enable viewing of all options. Figure 44 (<i>Identification Guide</i>) contains the <i>Flow Sense</i> drop down selection box.

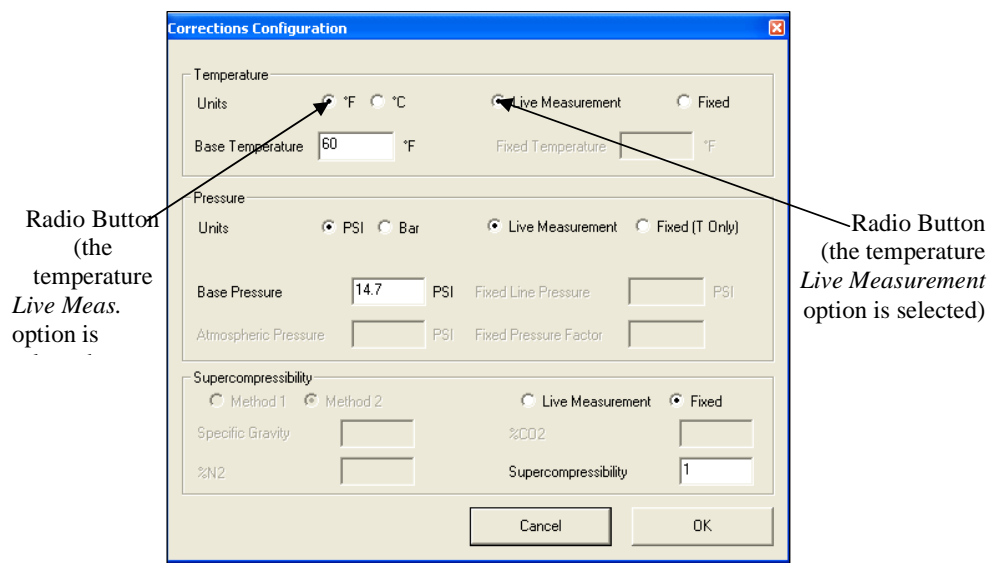
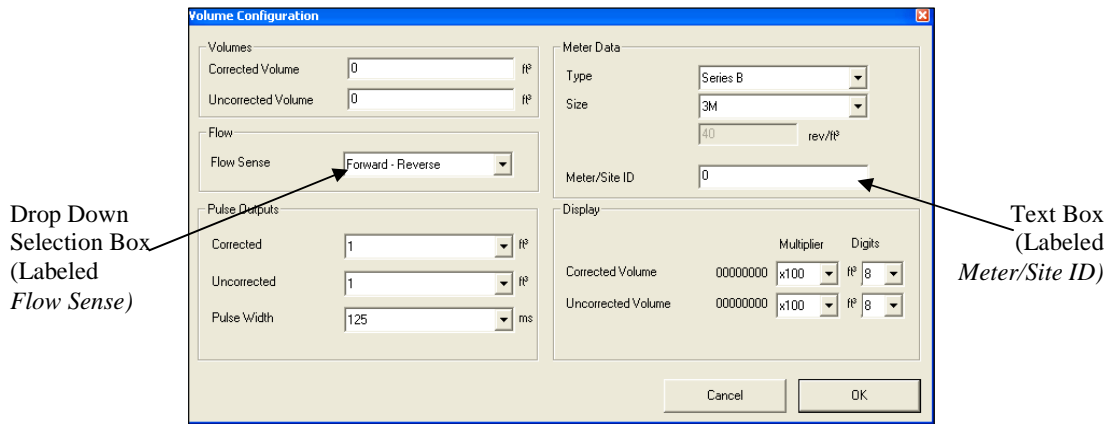
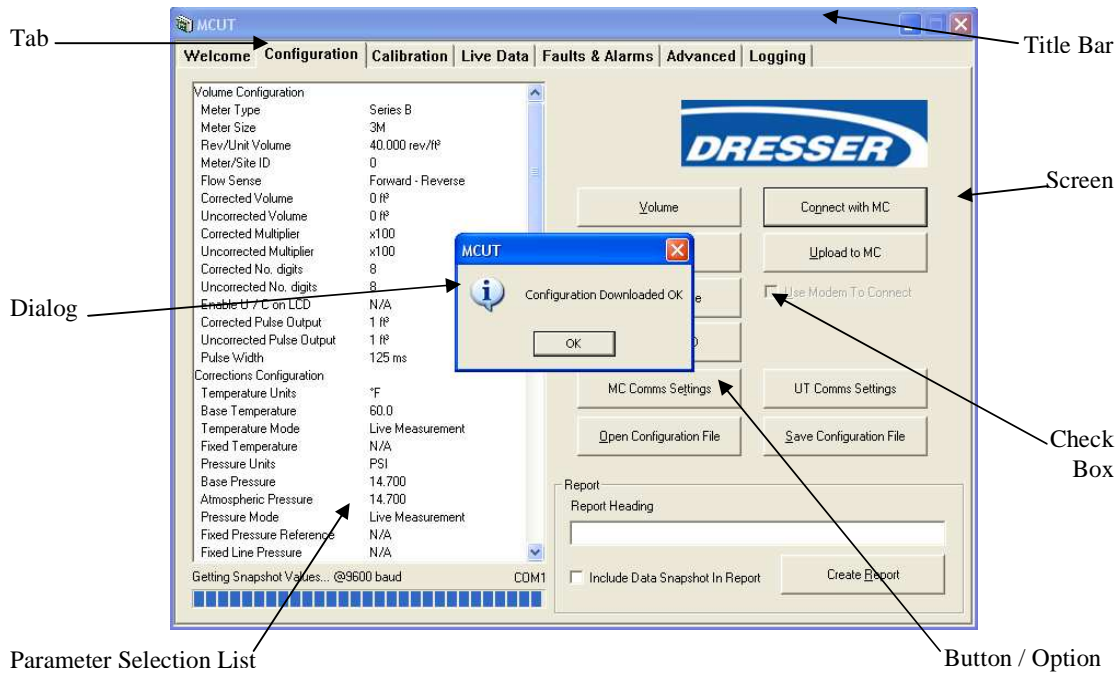


Figure 44 - Identification Guide A

Appendix B – MCUT Software Licence Agreement

Dresser UK Ltd., Yeoman Industrial Estate, Test Lane, Nursling, Southampton, SO16 9JX (the "Licensor" which expression shall include its subsidiaries, agents, successors and assigns) is authorised to license the software (the "Software") contained in this package and upon opening the sealed package the Licensee accepts a non-exclusive, non-transferable Licence to "Use" (as hereinafter defined) the Software on an IBM compatible PC computer) for single use upon the terms and subject to the conditions contained herein.

This Licence entitles the Licensee to:

- (a) load, install and Use the Software contained in this package on a single IBM compatible PC;
- (b) Use the Software in accordance with the provisions of Clause 2 of this Licence;

and, where the Licensee signs and returns the warranty card enclosed with the Software, to:

- (a) receive the Licensor's bulletin reports of errors and "patches" and receive such new updates of the Software incorporating the same;
- (b) receive information on upgraded versions of the Software at such cost (if any) as may be notified to the Licensee.

1. Acceptance of this Licence

The terms and conditions of this Licence are deemed to be accepted by the parties as follows:

- (a) by the Licensor upon dispatch/delivery by the Licensor of this package to the Licensee direct or to the Licensor's agent as the case may be; and
- (b) by the Licensee by breaking the seal of this sealed package containing the Software.

2. Use of the Software

For the purposes of this Licence "Use" shall mean and include:

- (a) utilisation of the Software by loading the same into the hard disk (HD) of the PC for the processing of the instructions or statements contained in such Software;
- (b) copying the Software which is in machine-readable form for Use by the Licensee on the PC for the purposes only of understanding the contents of such machine-readable material or as otherwise permitted by the applicable law;
- (c) merging the whole or any part of the Software in machine-readable form into another software program;
- (d) utilising (but not copying) the instructional and/or operational manuals relating to the Software.

3. Licensee's Undertakings

(a) The Licensee undertakes not to perform any of the acts referred to in this sub-clause (a) except to the extent and only to the extent permitted by the applicable law to the Licensee as a lawful user (i.e. a party with a right to use) of the Software and only then for the specific limited purpose stated in such applicable law or hereunder. The Licensee undertakes:

(i) not to copy the Software (other than for normal operation of the PC and as specified in Clause 2 above) nor otherwise reproduce the same;

(ii) not to translate, adapt, vary, modify the Software;

(iii) not to disassemble, decompile or reverse engineer the Software Provided however that in the case of decompilation, the Licensee may incidentally decompile the Software only if it is essential so to do in order to achieve interoperability of the Software with another software program ("Permitted Purpose") and provided the information

obtained by the Licensee during such decompilation is only used for the Permitted Purpose and is not disclosed or communicated to any third party whom it is not necessary to disclose or communicate such information without the Licensor's prior written consent and is not used to create any software which is substantially similar to the expression of the Software nor used in any manner which would be restricted by copyright.

The Licensee undertakes:

- (a) to maintain accurate and up-to-date records of the number and location of all copies of the Software.
- (b) to supervise and control Use of the Software in accordance with the terms of this Licence.
- (c) to ensure that its employees, agents and other parties who will use the Software are notified of this Licence and the terms hereof prior to such employee, agent or party using the same.
- (d) to reproduce and include the copyright notice of the Licensor or such other party as may be specified in or on the Software (the "Owner") on all and any copies, whether in whole or in part, in any form, including partial copies or modifications of the Software made herein.
- (e) not to provide or otherwise make available the Software in whole or in part (including where applicable, but not limited to program listings, object code and source program listings, object code and source code), in any form to any person other than the Licensee's employees or as specified in (d) above without prior written consent from the Licensor.
- (f) within 14 days after the date of termination or discontinuance of this Licence for whatever reason, to destroy the Software and all updates, upgrades or copies, in whole and in part, in any form including partial copies or modifications of the Software received from the Licensor or made in connection with this Licence, and all documentation relating thereto.

4. Warranty

- (a) The Licensee acknowledges that software in general is not error-free and agrees that the existence of such errors shall not constitute a breach of this Licence.
- (b) In the event that the Licensee discovers a material error which substantially affects the Licensee's use of the same and notifies the Licensor of the error within 90 days from the date of payment of the Licence Fee (the "warranty period") the Licensor shall at its sole option either refund the licence fee or use all reasonable endeavours to correct by patch or new release (at its option) that part of the Software which does not so comply PROVIDED THAT such non-compliance has not been caused by any modification, variation or addition to the Software not performed by the Licensor or caused by its incorrect use, abuse or corruption of the Software or by use of the Software with other software or on equipment with which it is incompatible.
- (c) To the extent permitted by the applicable law, the Licensor disclaims all other warranties with respect to the Software, either express or implied, including but not limited to any implied warranties of merchantability or fitness for any particular purpose.
- (d) Although the Licensor does not warrant that the Software supplied hereunder shall be free from all known viruses it has used commercially reasonable efforts to check for the most commonly known viruses prior to packaging but the Licensee is solely responsible for virus scanning the Software.
- (e) The Licensor warrants that there are no disabling programs or devices in the Software.

5. Licensor's Liability

- (a) The Licensor shall not be liable to the Licensee for any loss or damage whatsoever or howsoever caused arising directly or indirectly in connection with this Licence, the Software, its use or otherwise, except to the extent that such liability may not be lawfully excluded under the applicable law.
- (b) Notwithstanding the generality of (a) above, the Licensor expressly excludes liability for indirect, special, incidental or consequential loss or damage which may arise in respect of the Software, its use, the PC or in respect of other equipment or property, or for loss of profit, business, revenue, goodwill or anticipated savings.

(c) In the event that any exclusion contained in this Licence shall be held to be invalid for any reason and the Licensor becomes liable for loss or damage that may lawfully be limited, such liability shall be limited to the licence fee paid by the Licensee for the Software.

(d) The Licensor does not exclude liability for death or personal injury to the extent only that the same arises as a result of the negligence of the Licensor, its employees, agents or authorised representatives.

6. Copyright, Patents, Trade Marks and Other Intellectual Property Rights

The Licensee acknowledges that any and all of the copyright, trade marks, trade names, patents and other intellectual property rights subsisting in or used or in connection with the Software including all documentation and manuals relating thereto are and remain the sole property of the Licensor and/or the Owner. The Licensee shall not during or at any time after the expiry or termination of this Licence in any way question or dispute the ownership by the Licensor and/or the Owner thereof.

7. Confidential Information

(a) All information, data, drawings, specifications, documentation, software listings, source or object code which the Licensor may have imparted and may from time to time impart to the Licensee relating to the Software (other than the ideas and principles which underlie the Software) is proprietary and confidential. The Licensee hereby agrees that it shall use the same solely in accordance with the provisions of this Licence and that it shall not at any time during or after expiry or termination of this Licence, disclose the same, whether directly or indirectly, to any third party without the Licensor's prior written consent.

(b) Subject only to the specific, limited provisions of Clause 3(a) above, the Licensee further agrees that it shall not itself or through any subsidiary, agent or third party use such confidential information to copy, reproduce, translate, adapt, vary, modify, decompile, disassemble or reverse engineer the Software nor shall the Licensee sell, lease, license, sub-license or otherwise deal with the Software or any part or parts or variations, modifications, copies, releases, versions or enhancements thereof or have any software or other program written or developed for itself based on any confidential information supplied to it by the Licensor.

(c) The foregoing provisions shall not prevent the disclosure or use by the Licensee of any information which is or hereafter, through no fault of the Licensee, becomes public knowledge or to the extent permitted by law.

8. Force Majeure

The Licensor shall be under no liability to the Licensee in respect of anything which, apart from this provision, may constitute breach of this Licence arising by reason of force majeure.

9. Termination

(a) In addition to provisions for termination as herein provided, the Licensor may by notice in writing to the Licensee terminate this Licence if the Licensee is in breach of any term, condition or provision of this Licence or required by the applicable law and fails to remedy such breach (if capable of remedy) within 30 days of having received written notice from the Licensor specifying such breach.

(b) Upon termination, the Licensee shall pay to the Licensor all costs and expenses, including legal and other fees incurred and all charges or other payments arising in respect of the Software, this Licence or otherwise and shall comply with its undertaking specified in Clause 3(g) above.

(c) Termination, howsoever or whenever occasioned shall be subject to any rights and remedies the Licensor may have under this Licence or under the applicable law.

10. Assignment

The Licensee shall not assign or otherwise transfer all or any part of the Software or this Licence without the prior written consent of the Licensor.

11. Waiver

Failure or neglect by either party to enforce at any time any of the provisions hereof shall not be construed nor shall be deemed to be a waiver of that party's rights hereunder nor in any way affect the validity of the whole or any part of this Licence nor prejudice that party's rights to take subsequent action.

12. Headings

The headings of the terms and conditions herein contained are inserted for convenience of reference only and are not intended to be part of or to affect the meaning or interpretation of any of the terms and conditions of this Licence.

13. Severability

In the event that any of these terms and conditions or provisions shall be determined by any competent authority to be invalid, unlawful or unenforceable to any extent, such term, condition or provision shall to that extent be severed from the remaining terms, conditions and provisions which shall continue to be valid to the fullest extent permitted by law.

14. Law

The parties hereby agree that the Licence concluded between them and constituted on these terms and conditions shall be construed in accordance with English Law.