

Technical Bulletin, Operating the Suitcase Prover



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Scope

This Technical Bulletin contains supplementary information relating to the operation and use of the OMNI Flow Computer Suitcase Prover Computer. Basic knowledge of the OMNI Flow Computer and how to operate the OMNICOM program is assumed. If the information you require is not contained in this document refer to the OMNI Flow Computer Manual (Volumes 1 through 4) or additional Technical Bulletins contained on the CD-ROM provided with the equipment. Help on OMNICOM can be found in the OMNICOM Quick Start Guide provided on the OMNICOM installation CD-ROM.

Abstract

The OMNI Suitcase Prover Computer is a customized application of the OMNI 3000 Flow Computer. The flow computer is mounted to a control panel that is resiliently mounted within a durable suitcase. The internal surfaces of the suitcase are coated with a conductive flexible shielding material for static electricity protection and RF shielding purposes. The suitcase provides a convenient package that is both rugged and portable. There are several panel versions suitable for use with different prover types (Figures 1 thru 4).

Previous Production Suitcase Prover

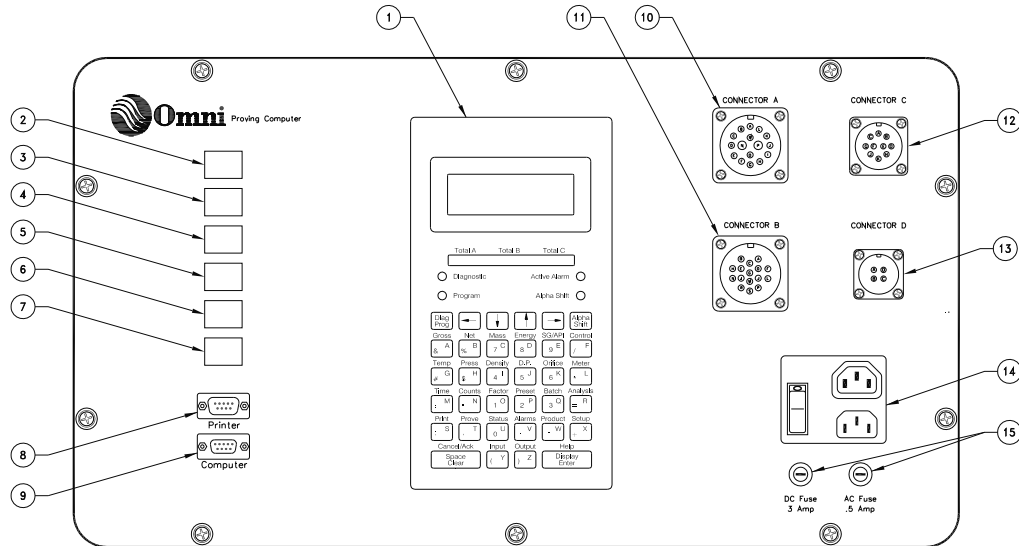


Figure 1. Control Panel (Emerson/Brooks SVP)

The Control Panel (Figure 1) contains the following items:

- 1. OMNI 3000 Flow Computer
- 2. thru 7. Six lighted push button switches to operate the connected Prover System.
 - Detector Switch Status*
 - Upstream Signal* (Indicates that the piston is in the upstream position ready to launch)
 - Run Command* (Launches the piston and remains on while the piston is moving to the downstream position)
 - Prove Request/Abort*
 - Plenum Low Alarm (Indicates that the nitrogen plenum pressure is below its set-point)
 - Report Reprint
- *In addition to indicating status conditions, pressing these buttons forces the appropriate signal to be active for testing and override purposes.
- 8. 9 pin RS232C male connector to printer
- 9. 9 pin RS232C female connector to computer (Modbus Protocol)
- 10. MS screw type connector (A) prover wiring (OMNI drawing 20900101.pdf sheet 2 of 3)
- 11. MS screw type connector (B) prover wiring (OMNI drawing 20900101.pdf sheet 2 of 3)
- 12. MS screw type connector (C) Test Meter wiring (OMNI drawing 20900101.pdf sheet 2 of 3)
- 13. MS screw type connector (D) Master Meter wiring (OMNI drawing 20900101.pdf sheet 2 of 3)
- 14. AC Power receptacle with On/Off Switch
- 15. 2 AG 3A Slow Blow DC fuse and 2AG 0.5A Fast Blow AC fuse

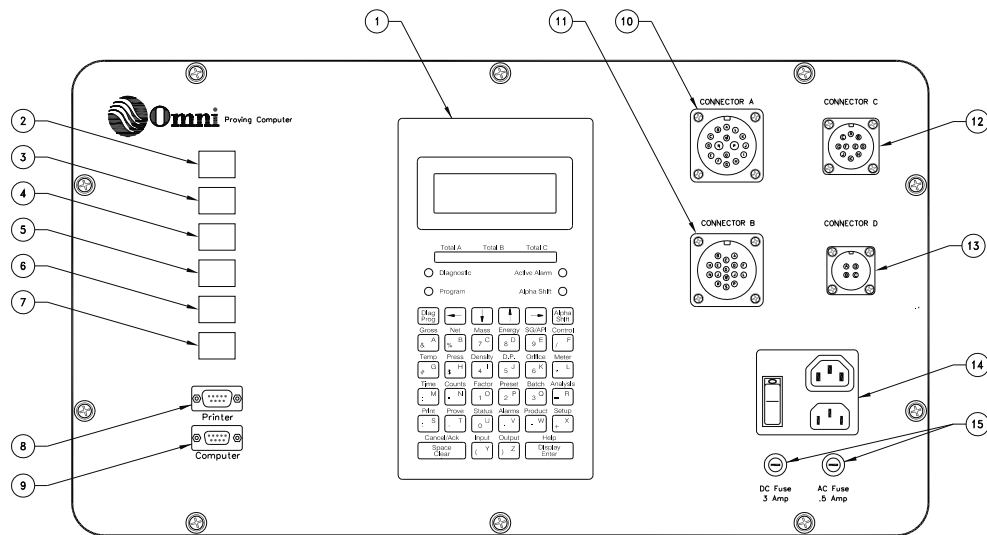


Figure 3. Control Panel (Bi-Directional Pipe)

The control panel (Figure 3) contains the following items:

- 1. OMNI 3000 Flow Computer
 - 2. thru 7. Six lighted push button switches to operate the connected Prover System.
 - Detector Switch Status *
 - 4 –Way Valve Seal Status* (Indicates that the 4 way valve is fully seated and a positive seal exists between its inlet/outlet ports. This status must be true before the first detector switch signal is received and remain true while the sphere is between the detector switches. If this is not the case the prove sequence will be aborted)
 - Launch Forward Command Status * (Activates for two seconds to switch the 4 way valve to the forward position and launch the sphere)
 - Launch Reverse Command Status* (Activates for two seconds to switch the 4 way valve to the reverse position and launch the sphere)
 - Prove Request/Abort
 - Reprint Request
- *In addition to indicating status conditions, pressing these buttons forces the appropriate signal to be active for testing and override purposes.
- 8. 9 pin RS232C male connector to printer
 - 9. 9 pin RS232C female connector to computer (Modbus Protocol)
 - 10. MS screw type connector (A) prover wiring (OMNI drawing 20900104.pdf sheet 2 of 2)
 - 11. MS screw type connector (B) prover wiring (OMNI drawing 20900104.pdf sheet 2 of 2)
 - 12. MS screw type connector (C) Test Meter wiring (OMNI drawing 20900104.pdf sheet 2 of 2)
 - 13. MS screw type connector (D) Master Meter wiring (OMNI drawing 20900104.pdf sheet 2 of 2)
 - 14. AC Power receptacle with On/Off Switch
 - 15. 2AG 3A Slow Blow DC fuse and 2AG 0.5A Fast Blow AC fuse

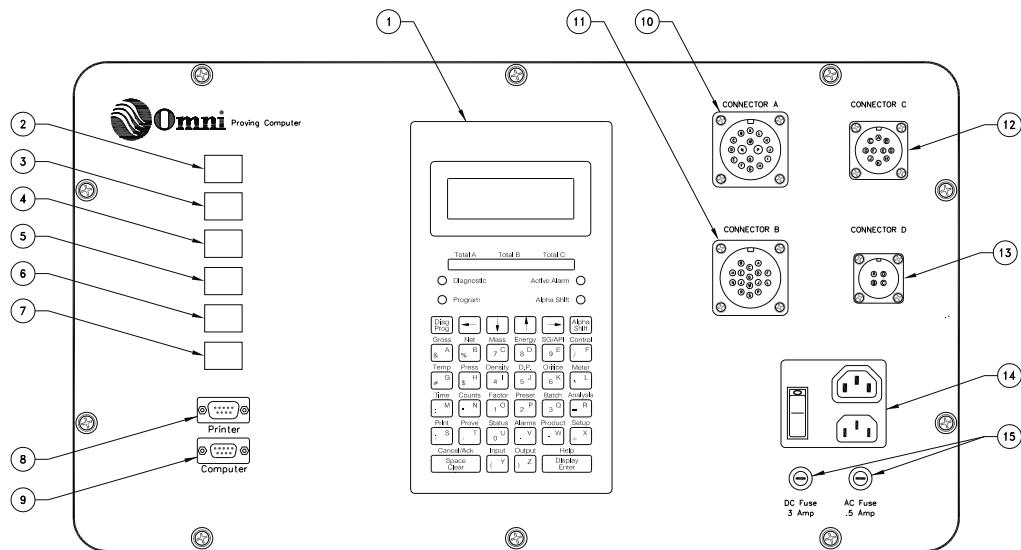


Figure 4. Control Panel (PECO Uni-Directional)

The Control Panel (Figure 4) contains the following items:

- 1. OMNI 3000 Flow Computer
- 2. thru 7. Six lighted push button switches to operate the connected Prover System.
 - Detector Switch Status*
 - Seal OK Status* (Indicates that there is a positive seal between the prover inlet and outlet ports. This must occur before the sphere activates the first detector switch and must be maintained while the sphere is between the detector switches. If the seal is lost the prove sequence will be aborted)
 - Retract Ram Command* (The ram is retracted and held for 30 seconds to allow the sphere to drop into the launch position. The command is also activated for 1.5 seconds at the completion of the prove sequence to relieve pressure on the soft seat material of the launch chamber seal)
 - Seat Ram Command* (The ram moves to launch the sphere into the flow stream and seal off the prover outlet port from the inlet port)
 - Prove Request/Abort Command
 - Report Reprint
- *In addition to indicating status conditions, pressing these buttons forces the appropriate signal to be active for testing and override purposes.
- 8. 9 pin RS232C male connector to printer
- 9. 9 pin RS232C female connector to computer (Modbus Protocol)
- 10. MS screw type connector (A) prover wiring (OMNI drawing 20900101.pdf sheet 2 of 3)
- 11. MS screw type connector (B) prover wiring (OMNI drawing 20900101.pdf sheet 2 of 3)
- 12. MS screw type connector (C) Test Meter wiring (OMNI drawing 20900101.pdf sheet 2 of 3)
- 13. MS screw type connector (D) Master Meter wiring (OMNI drawing 20900101.pdf sheet 2 of 3)
- 14. AC Power receptacle with On/Off Switch
- 15. 2 AG 3A Slow Blow DC fuse and 2AG 0.5A Fast Blow AC fuse

Current Production Suitcase Prover: All Prover Types

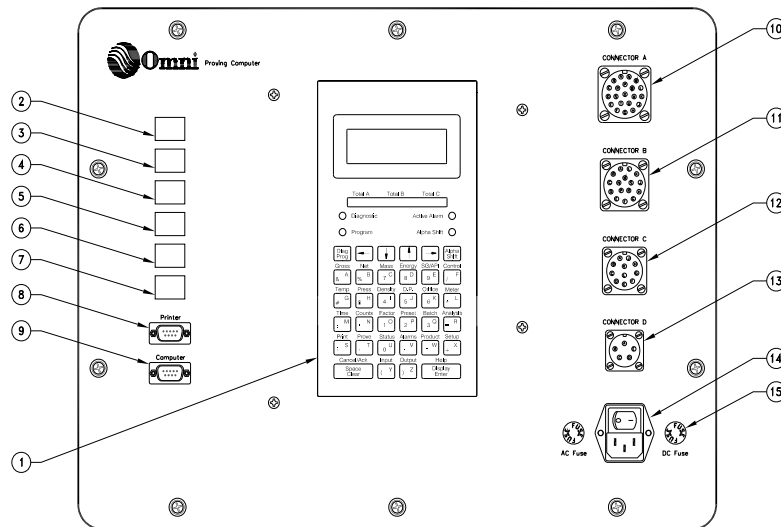


Figure 5. Suitcase Control Panel

The Control Panel (Figure 5) contains the following items:

- 1. OMNI 3000 Flow Computer
- 2. thru 7. Six lighted push button switches to operate the connected Prover System. (Switch operation as on all previous panels no changes)
 - *In addition to indicating status conditions, pressing these buttons forces the appropriate signal to be active for testing and override purposes.
- 8. 9 pin RS232C male connector to printer
- 9. 9 pin RS232C female connector to computer (Modbus Protocol)
- 10. PT Quick Bayonet Type Connector (A) prover wiring *see correct drawings listed below
- 11. PT Quick Bayonet Type Connector (B) prover wiring *see correct drawings listed below
- 12. PT Quick Bayonet Type Connector (C) Test Meter wiring *see correct drawings listed below
- 13. PT Quick Bayonet Type Connector (D) Master Meter wiring *see correct drawings listed below
- 14. AC Power receptacle with On/Off Switch
- 15. 5x20mm 3A Slow Blow DC fuse and 5x20mm 1.6A Fast Blow AC fuse

Drawings required for the new Control Panel are as follows:

- *OMNI 20900111 Brooks Prover
- *OMNI 20900112 Calibron Prover
- *OMNI 20900113 Master Meter Prover
- *OMNI 20900114 Bi-Directional Prover
- *OMNI 20900115 PECO Uni-Directional Prover

NOTES: In place of the standard serial module (68-6205), the user may request a single Ethernet Module (62-6209) supplied with a special DB9 to RJ45 cable assembly for OMNICOM communications via Ethernet.

Prover power supply module (68-6218) is a universal input 110/250 VAC 50/60 Hz supply.

Connectors/Cables from the previous style prover panel are not interchangeable with the current production style prover panel.

Getting Started

OMNICOM Configuration Files

The OMNI Suitcase Prover Computer must be loaded with a valid configuration file before use. Configurations are loaded using the OMNICOM configuration program provided with the flow computer. A configuration file contains information such as the type of prover (unidirectional pipe compact or Bi-directional pipe compact) being used, prover water draw information, and transducer scaling ranges, etc. The configuration file also contains information about the flowmeter being calibrated: meter tag name, meter K-Factor, and other identification information about the flowmeter that appears on the prover report.

Step 1 - Create Generic Configuration Files for Each Prover

When an OMNI Suitcase Prover Computer is used with more than one prover, you must create a generic OMNICOM configuration file for each prover that will be connected. Each configuration file will contain specific information relating to the prover, i.e. prover type (bi-directional or master meter), water draw volume, transmitter-scaling values etc. Save these configuration files using descriptive filenames that clearly identify the target prover.

NOTE: Sample files for each Prover type are included with the Suitcase Prover Computer.

Step 2 - Create a Configuration File for Each Flowmeter to be Calibrated

Perform the following for each flowmeter that will be calibrated:

- Create a unique configuration file in OMNICOM by opening the appropriate generic file for the prover to be used (created at Step 1).
- Make the configuration file flowmeter specific by adding the target flowmeter's information, i.e. meter tag, meter ID, meter size, and meter K-Factor etc. This information appears on the printed prove report which is produced at the completion of a prove sequence (meter calibration).
- Save the edited file using the 'Save As' feature of OmniCom. Use a descriptive name that clearly identifies the target flowmeter. The filename given to the configuration file can also form the basis of the filename that will be used when prove reports are stored to the PC's hard disk. This will make organizing and retrieving reports for a specific flowmeter easy.

Step 3 – Connect the Suitcase Prover Computer to the Prover

Using the mating cable connectors provided, make up cables to connect the Suitcase Prover Computer to the prover instrumentation, and also to the flow meter being calibrated. Refer to supplied OMNI drawings for details of the connector pin designations. Make the connections observing all appropriate safety standards and regulations. The Suitcase Prover Computer is not suitable for operation in hazardous areas.

Step 4 – Transmit the Flowmeter Specific Configuration File to the Prover Computer

Connect the PC's serial port (or Ethernet connection suitcase) to the Prover Computer using the cable supplied. Using OMNICOM, open the appropriate flowmeter configuration file, establish a 'Connection' to the Suitcase Prover Computer and transmit the configuration file to the suitcase Prover Computer.

Step 5 – Operate the Prover Computer and Calibrate the Flowmeter

The Prover sequence is initiated, and monitored as follows:



- Using the control panel push buttons to run the prover
 - Momentarily pressing the ‘Prove Request’ button (6) on the control panel will initiate a prove sequence. The lighted control panel buttons indicate the status of the detector switches, launch command signals and prove sequence in progress.
- Using the Flow Computer Key Pad to run the prover
 - Press ‘Program’ ‘Prove’ ‘Enter’
 - Scroll the cursor down to ‘Prove Meter ‘n’ and enter ‘1’ ‘Enter’
 - Enter a valid password if requested and press ‘Enter’

NOTE: Tip: clearing the Level 2 password in the ‘Password Maintenance’ menu will allow you to bypass the password prompt by simply pressing the ‘Enter’ key when requested for a password.

 - The OMNI Flow Computer will automatically return the LCD screen to the display mode and will show the meter counts and prove status as the prove sequence progresses.

Using the OMNICOM Software to Run the Prover

Perform the following to run the software to the prover:

- Establish a connection to the Suitcase Prover Computer by selecting the ‘Online’ button  and double clicking on the ‘Direct 9600, Unit 1 – ID 1 selection.
- NOTE:** The serial port on the prover computer defaults to 9600 baud, 8, 1, N Modbus ID 1
- Select the ‘Operate’  mode.
- In the left hand pane, select the ‘Control’, ‘Prover’ object as shown in Figure 6.

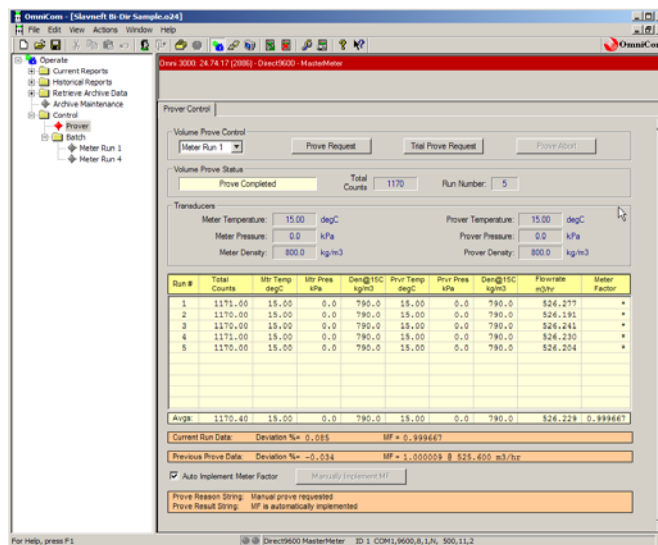
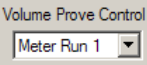




Figure 6. Control, Prover

- Select the meter to prove in the drop down box .
Meter Run 1 = Test Meter, Meter Run 4 = Master Meter
- To start a prove select the  button.

Step 6 - Printing and Saving the Flowmeter Calibration Prove Report

Perform the flowmeter calibration as described in this Technical Bulletin. If a printer is connected to the Suitcase Prover Computer a prove report will print automatically after the prove sequence completes. This prove report, is also saved in the prover computer's historical storage buffer. A maximum of eight Prove Reports can be stored in the historical storage buffer before the oldest prove report is overwritten by the latest report.

To avoid overwriting valuable prove reports you must retrieve and save these stored reports using OMNICOM as follows:

- Select the 'Operate'  mode.
- In the left hand pane, select the 'Historical Reports', 'Prove' and then select a prove report to retrieve from the prover computer.

NOTE: First is the most recent report added, eighth is the oldest report. OMNICOM will automatically retrieve and display, the selected prove report as shown in Figure 7.

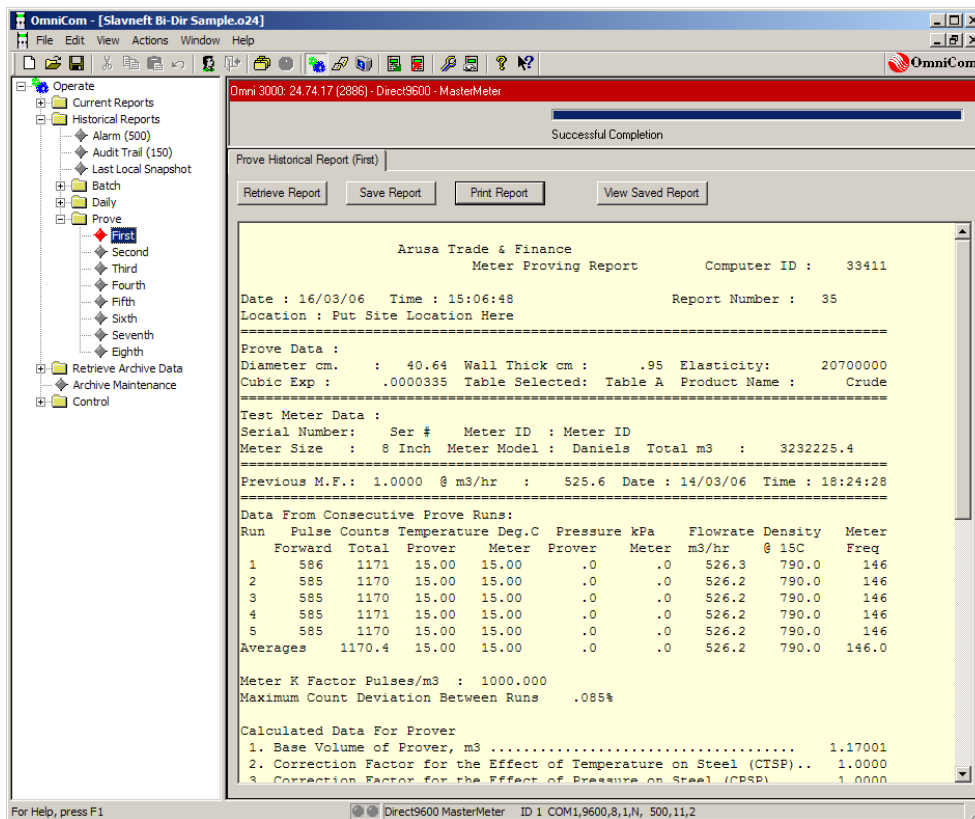
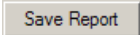
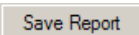


Figure 7. Display of Selected Prove Report

- From Figure 7, you can choose from the drop down menu on the left side of the screen 1 thru 8 to print the selected report to any printer, local or network, accessible to the PC running OMNICOM.

Step 7 – Saving the Report

Use the  button to save the selected report to disk. The path used to store the selected report will depend upon which disk the running copy of OMNICOM is installed on (local or network). If you accepted the default options when OMNI was installed your prove reports will be stored on your local C: drive in one of two places depending upon the file naming convention selected when you clicked the  button. Filenames with .p01 through .p08 extensions will be saved in C:\OmniFlow\OmniCom\Reports. Filenames with .txt extensions will be saved in C:\OmniFlow\OmniCom\Reports\Archive as shown in Figure 8.

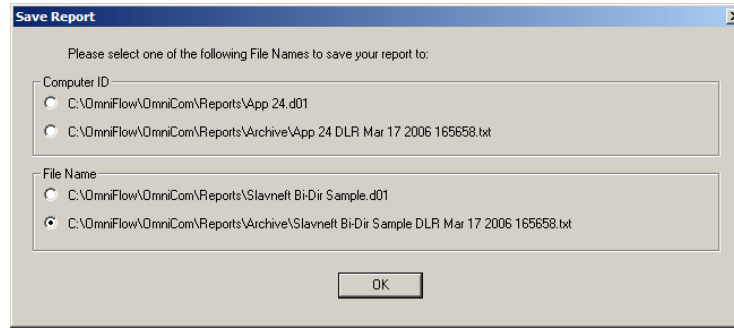


Figure 8. File Naming Convention

Filenames Compatible to those Created by DOS OMNICOM

Some users have legacy software applications which expect stored reports to have filenames and extensions as created by previous versions of OMNICOM running in a DOS environment. These filenames have extensions of .p01 through .p08 and are limited to eight character filenames. OMNICOM provides filenames that are 'Computer ID' based or configuration filename based.

Descriptive Filenames Created for use with Windows OS

Microsoft Windows applications can use long filenames that allow for descriptive filenames. These filenames have extensions of .txt OMNICOM provides filenames that are 'Computer ID' based or configuration filename based.

DOCUMENT REVISION HISTORY

DOCUMENT INITIAL RELEASE DATE.....02-November-2009

<u>REVISION</u>	<u>DATE</u>	<u>PURPOSE / CHANGE REQUEST</u>
A	02-November-2009	DCR 090292 - Initial release
B	18-October-2010	DCR 100057
C	26-July-2011	DCR 110102