



FerMon OPC Data Server 1.2  
-  
Manual

# Table of Contents

1	Introduction .....	2
2	Setup.....	3
3	Configuring FerMon .....	7
4	Connecting to FerMon .....	8
5	Tag Database .....	10
6	Support .....	12

## 1 Introduction

FerMon OPC Data Server is an OPC server for the Innova 1313 Fermentation Monitor. It offers the OPC Data Access 1.0 and 2.0 interfaces, which are open industry standards supported by all major SCADA (Supervisory Control And Data Acquisition) systems, including for instance B. Braun Biotech MFCS/win.

FerMon OPC Data Server was created by Software Consult, a company which produces custom OPC servers for equipment, industrial software, and more. Please visit our website at [www.softwareconsult.dk](http://www.softwareconsult.dk) for more information, or write an email to [info@softwareconsult.dk](mailto:info@softwareconsult.dk).

### Features

FerMon OPC Data Server is designed to integrate your Innova equipment seamlessly into your existing system or network.

- Access all data points through OPC tags, including:
  - Gas concentrations (O<sub>2</sub>, CO<sub>2</sub>, and hydrocarbons)
  - Temperatures
  - Pressures
  - Software settings and current status
  - Occlusion alarm (optional)
- Control the Innova Fermentation Monitor 1313 and up to three Innova Multipoint Sampler 1309 units remotely
- Easy setup – single installer, no configuration<sup>1</sup>
- No maintenance or supervision required

### Options

Choose one of three versions according to your needs:

- **FerMon Standard:** Full access to all data points.
- **FerMon Demo:** Like Standard, but limited to run for three hours.
- **FerMon +Occlusion:** Like Standard, but an OcclusionStatus tag indicates whether the 1313 unit is experiencing occlusion. This version includes a USB analog I/O measurement device and requires a modification of the 1313 unit to signal occlusion on its rear 4-20mA relay.

### Requirements

- Windows XP SP2, Windows 2000 SP4 or Windows NT 4.0 SP6a
- Microsoft .NET Framework 2.0
- One available RS-232 serial port (standard COM port)
- One available USB port (two required for FerMon +Occlusion)

FerMon works with any OPC compliant system. It has been tested specifically with B. Braun Biotech MFCS/win 2.0 and 2.1. Other versions or systems can be tested on request.

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<sup>1</sup> Network security configuration may be required if connecting across a network.

## 2 Setup

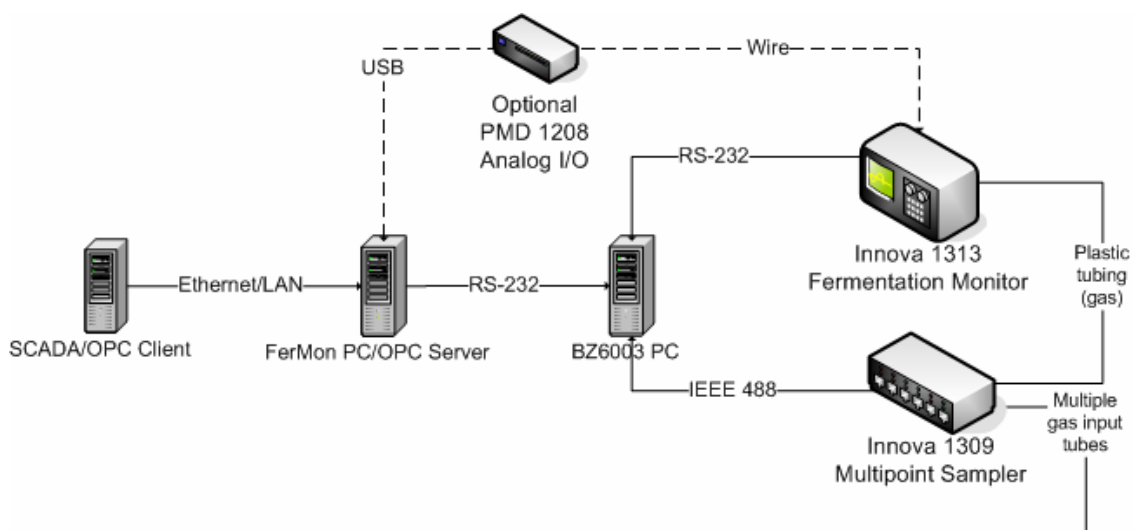
It is assumed that there is already a working setup consisting of an Innova 1313 Fermentation Monitor, a PC running the accompanying BZ6003 software, and optionally up to three Innova 1309 Multipoint Samplers.

This section describes how to connect and configure two PCs:

- The PC which runs the fermentation monitoring software BZ6003
- The PC which runs FerMon OPC Data Server

Please consult the following sections for instructions on how to do so. Figure 1 shows how all the equipment can be connected.

**Note:** This is merely an example of how a network may be set up. Software Consult cannot take responsibility for any security or regulatory concerns. Please confer with your local systems administrator.



**Figure 1: Connection diagram where the SCADA system and FerMon are connected through a LAN. It is also possible to place FerMon on the same PC as the SCADA system, avoiding using the network and reducing the number of PCs.**

### Connecting the PCs

Connect the FerMon PC to the BZ6003 PC: Choose an available RS-232 (standard COM port) serial port on each, and note down which ones were chosen for later. FerMon uses COM1 by default. The cable must be a high quality **null modem cable** that includes all wires (not just Rx, Tx and Gnd). Using a different kind of cable may cause failure to communicate.

### Installing FerMon

**Important:** If you have purchased FerMon with a hardware security dongle, DO NOT insert the dongle until AFTER FerMon has been installed.

**Important:** By installing FerMon you agree to the terms in the End User License Agreement which you can read during installation before clicking the I Agree button.

1. Install the Microsoft .NET Framework 2.0. If you received FerMon on a CD-ROM, then the installer for this is included on the same CD-ROM. Otherwise, please download it from Microsoft and install it.
2. Install FerMon from the CD-ROM or downloaded ZIP archive by double-clicking the FerMonOPCDataServerSetup.exe installer program and following the on-screen instructions. When the installation is finished, please restart the PC.
3. If you have purchased FerMon, please insert your hardware security dongle now.

4. If you have purchased FerMon with occlusion detection (hardware included), then please connect the PMD-1208LS to the USB port now. Refer to the device manual for setting up channel 0 for differential mode measurement. Summary: Wire pin 1 (CH0 IN HI) to signal, wire pin 2 (CH0 IN LO) to pin 3 (GND), wire pin 3 (GND) to ground.

### Configuring BZ6003

BZ6003 is the name of the software program which accompanies the Innova 1313 Fermentation Monitor. It is used to display graphs while measuring, to calibrate the sensors, and more. If you did not receive this software with your 1313 Fermentation Monitor, then please contact your vendor to obtain it.

FerMon communicates with BZ6003 over a serial cable connection. Using the OPTOMUX communication protocol, FerMon can read values from BZ6003 and send them to a SCADA system using the OPC Data Access protocol.

The BZ6003 software must be configured to use the OPTOMUX communication protocol in order to communicate with FerMon, and the Remote feature must be turned on and configured. Please follow the steps below. These instructions are merely meant as a quick setup guide – please consult the 1313 Fermentation Monitor Reference Manual for detailed instructions or in case of difficulties.

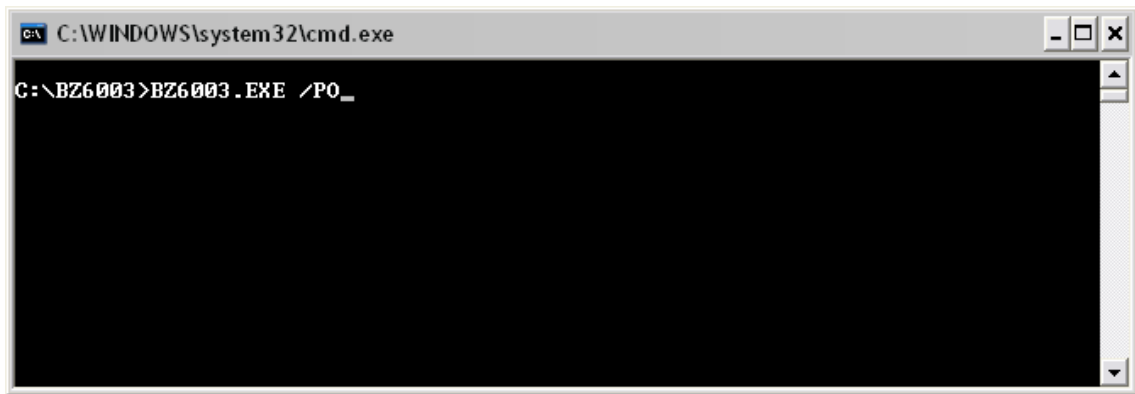


Figure 2: Start BZ6003 using the option /PO to set the remote communication protocol to OPTOMUX.

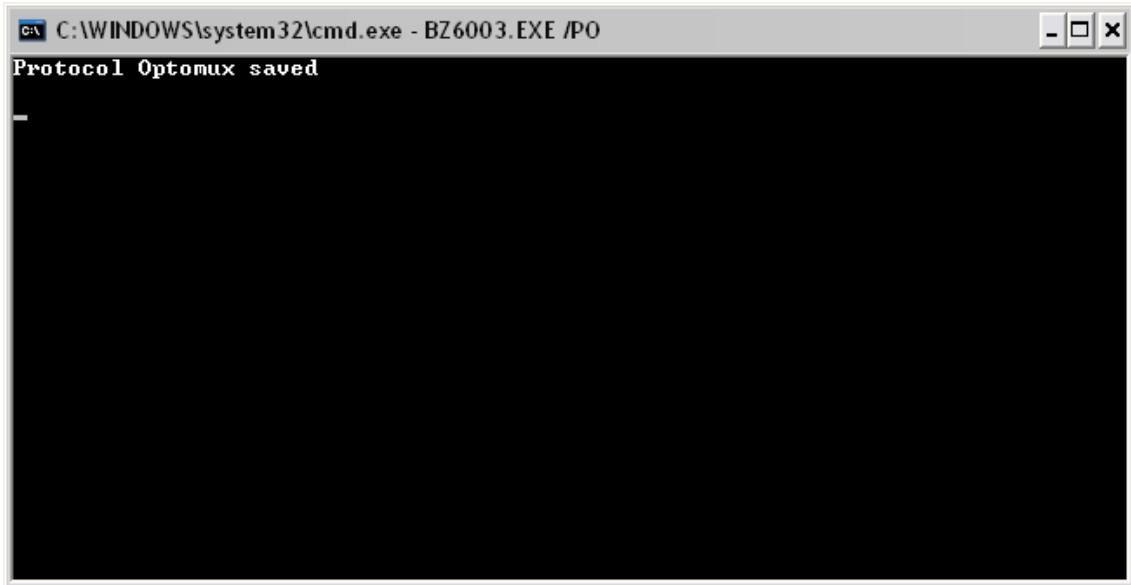


Figure 3: After BZ6003 is started with the /PO option, a message is briefly displayed saying “Protocol Optomux saved”, and the setting is saved in a configuration file for all future runs. The /PO option only needs to be used once.

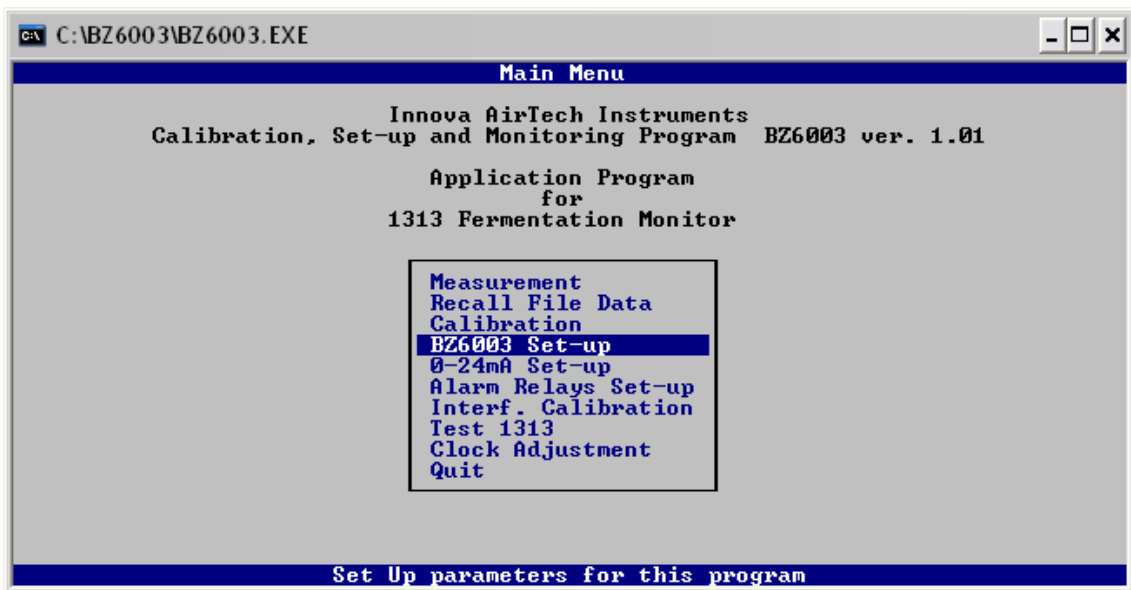


Figure 4: When BZ6003 has started, use the arrow keys to select the *BZ6003 Set-up* item on the *Main Menu*. Press the <return> key to enter the setup screen.

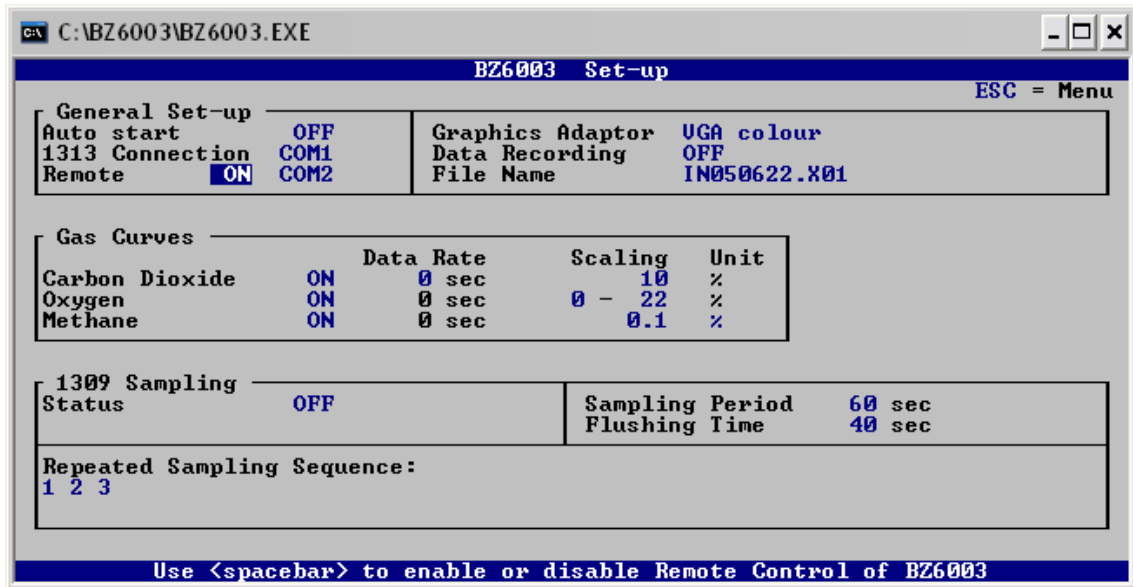
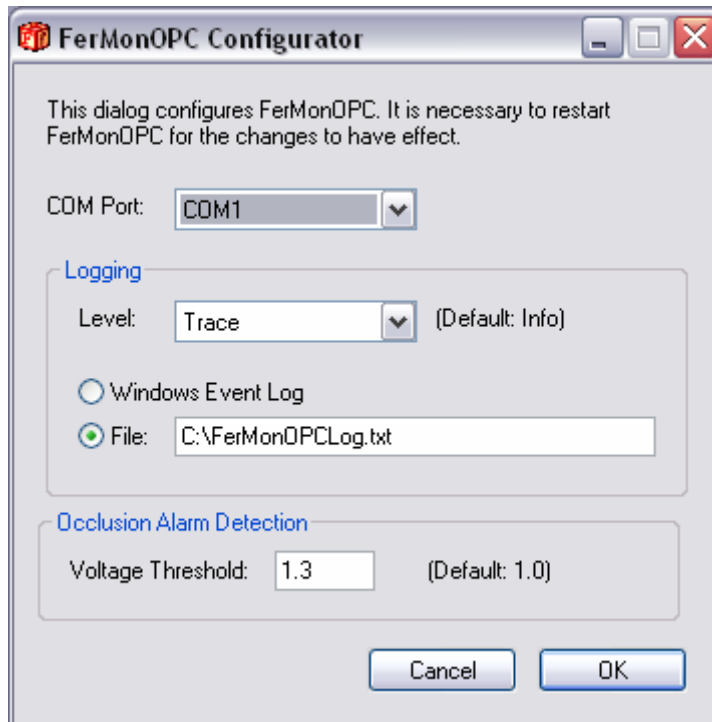


Figure 5: Use the arrow keys to move the selection to the *Remote* item. Using the <spacebar> key, set *Remote* to *ON* and select the serial port (whichever was chosen previously) which connects the BZ6003 PC to the FerMon PC. Exit the setup screen by pressing the <escape> key.

### 3 Configuring FerMon

FerMon comes with a configuration tool called FerMon Configurator. It can be found in the Start →All Programs menu.



**Figure 6: FerMon Configurator allows easy configuration of the OPC server.**

Using FerMon Configurator it is possible to set the serial port and logging options. It is also possible to set a threshold voltage, which is used to determine whether occlusion has occurred in the 1313 unit (only relevant for FerMon +Occlusion edition). The voltage must exceed the threshold for the OcclusionStatus tag to be signalled on.

Clicking the OK button saves the configuration and exits the program. FerMon must then be restarted before the changes have any effect.

There are tips for each area in the dialog, so hover the mouse pointer over any unclear areas and a helpful description will pop up after a few seconds.

## 4 Connecting to FerMon

FerMon does not run unless at least one OPC client is connected. The program starts up automatically when an OPC client connects, and it shuts down automatically when the last client has disconnected. There is no need to start FerMon manually or during startup.

**Important Note:** It is only possible to read values from FerMon when the BZ6003 software is measuring (you can tell that it is measuring if it is displaying a graph). To start measuring in BZ6003, select the *Measurement* item in the *Main Menu* and press the <return> key to activate it.

### Connecting to FerMon with an OPC client

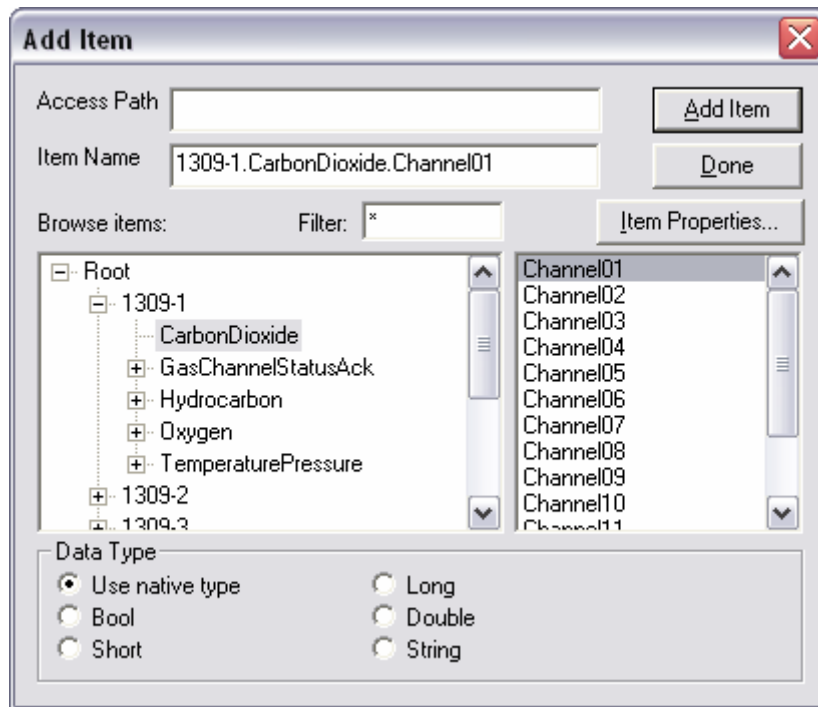
Any OPC client can be used to connect to FerMon, including the *OPCC* module in MFCS/win. It may be a good idea to test the connection with a simple OPC client first. The OPC server ID of FerMon is

`SoftwareConsult.FerMonOPC.1`

Below are shown example screenshots of the OPC client called FactorySoft OPC Client, which is available at [www.factorysoft.com](http://www.factorysoft.com). They show what it looks like when connecting to FerMon and browsing the tag database.



**Figure 7:** Connecting to FerMon using an OPC client can often be done by selecting the ID from a list or by typing it in a text field. Remember to specify which network host to connect to, if connecting over a local area network (LAN).



**Figure 8: Browsing the OPC tag database using an OPC client. The tags are organized in a hierarchy so that they are easy to find.**

### **Network Configuration**

If your OPC client is not located on the PC where FerMon is installed, then it is possible that your network needs to be configured. This is only necessary if you are not able to connect to FerMon over the network. Please configure DCOM and domain/workgroup settings on both computers appropriately. Since the configuration depends highly on your specific network setup, it cannot be covered in this manual.

## 5 Tag Database

The following tags are available in FerMon. There is a tag for each register in BZ6003. Refer to the 1313 Fermentation Monitor Reference Manual for access rights and descriptions.

1313Control.AutoMode	1309-1.TemperaturePressure.Temp02
1313Control.StartGainCalibration	1309-1.TemperaturePressure.Temp03
1313Control.CalibrationComplete	1309-1.TemperaturePressure.Temp04
1313Control.1313Error	1309-1.TemperaturePressure.Temp05
1313Control.1309Error	1309-1.TemperaturePressure.Temp06
1313Control.BZ6003DisabledRemoteMode	1309-1.TemperaturePressure.BarometricPressure1
1313Control.CHxCalibSuccess	1309-1.GasChannelStatusAck.O2
1313Control.CHxCalibFailure	1309-1.GasChannelStatusAck.CO2
1313Control.CHxCalibNoChange	1309-1.GasChannelStatusAck.CHx
1313Control.CO2CalibSuccess	
1313Control.CO2CalibFailure	1309-2.Oxygen.Channel13
1313Control.CO2CalibNoChange	1309-2.Oxygen.Channel14
1313Control.O2CalibSuccess	1309-2.Oxygen.Channel15
1313Control.O2CalibFailure	1309-2.Oxygen.Channel16
1313Control.O2CalibNoChange	1309-2.Oxygen.Channel17
1313Control.CalibTimeoutFailure	1309-2.Oxygen.Channel18
	1309-2.Oxygen.Channel19
1313General.CO2Avg	1309-2.Oxygen.Channel20
1313General.O2Avg	1309-2.Oxygen.Channel21
1313General.CO2GainCalib	1309-2.Oxygen.Channel22
1313General.O2GainCalib	1309-2.Oxygen.Channel23
1313General.CHxGainCalib	1309-2.Oxygen.Channel24
1313General.CHxAvg	1309-2.Oxygen.Raw1SecValue
1313General.O2BottomScale	1309-2.Oxygen.GasChannelStatus
1313General.O2FullScale	1309-2.CarbonDioxide.Channel13
1313General.CHxFullScale	1309-2.CarbonDioxide.Channel14
	1309-2.CarbonDioxide.Channel15
1309-1.Oxygen.Channel01	1309-2.CarbonDioxide.Channel16
1309-1.Oxygen.Channel02	1309-2.CarbonDioxide.Channel17
1309-1.Oxygen.Channel03	1309-2.CarbonDioxide.Channel18
1309-1.Oxygen.Channel04	1309-2.CarbonDioxide.Channel19
1309-1.Oxygen.Channel05	1309-2.CarbonDioxide.Channel20
1309-1.Oxygen.Channel06	1309-2.CarbonDioxide.Channel21
1309-1.Oxygen.Channel07	1309-2.CarbonDioxide.Channel22
1309-1.Oxygen.Channel08	1309-2.CarbonDioxide.Channel23
1309-1.Oxygen.Channel09	1309-2.CarbonDioxide.Channel24
1309-1.Oxygen.Channel10	1309-2.CarbonDioxide.Raw1SecValue
1309-1.Oxygen.Channel11	1309-2.CarbonDioxide.GasChannelStatus
1309-1.Oxygen.Channel12	1309-2.Hydrocarbon.Channel13
1309-1.Oxygen.Raw1SecValue	1309-2.Hydrocarbon.Channel14
1309-1.Oxygen.GasChannelStatus	1309-2.Hydrocarbon.Channel15
1309-1.CarbonDioxide.Channel01	1309-2.Hydrocarbon.Channel16
1309-1.CarbonDioxide.Channel02	1309-2.Hydrocarbon.Channel17
1309-1.CarbonDioxide.Channel03	1309-2.Hydrocarbon.Channel18
1309-1.CarbonDioxide.Channel04	1309-2.Hydrocarbon.Channel19
1309-1.CarbonDioxide.Channel05	1309-2.Hydrocarbon.Channel20
1309-1.CarbonDioxide.Channel06	1309-2.Hydrocarbon.Channel21
1309-1.CarbonDioxide.Channel07	1309-2.Hydrocarbon.Channel22
1309-1.CarbonDioxide.Channel08	1309-2.Hydrocarbon.Channel23
1309-1.CarbonDioxide.Channel09	1309-2.Hydrocarbon.Channel24
1309-1.CarbonDioxide.Channel10	1309-2.Hydrocarbon.Raw1SecValue
1309-1.CarbonDioxide.Channel11	1309-2.Hydrocarbon.GasChannelStatus
1309-1.CarbonDioxide.Channel12	1309-2.TemperaturePressure.Temp07
1309-1.CarbonDioxide.Raw1SecValue	1309-2.TemperaturePressure.Temp08
1309-1.CarbonDioxide.GasChannelStatus	1309-2.TemperaturePressure.Temp09
1309-1.Hydrocarbon.Channel01	1309-2.TemperaturePressure.Temp10
1309-1.Hydrocarbon.Channel02	1309-2.TemperaturePressure.Temp11
1309-1.Hydrocarbon.Channel03	1309-2.TemperaturePressure.Temp12
1309-1.Hydrocarbon.Channel04	1309-2.TemperaturePressure.BarometricPressure2
1309-1.Hydrocarbon.Channel05	1309-2.GasChannelStatusAck.O2
1309-1.Hydrocarbon.Channel06	1309-2.GasChannelStatusAck.CO2
1309-1.Hydrocarbon.Channel07	1309-2.GasChannelStatusAck.CHx
1309-1.Hydrocarbon.Channel08	
1309-1.Hydrocarbon.Channel09	1309-3.Oxygen.Channel25
1309-1.Hydrocarbon.Channel10	1309-3.Oxygen.Channel26
1309-1.Hydrocarbon.Channel11	1309-3.Oxygen.Channel27
1309-1.Hydrocarbon.Channel12	1309-3.Oxygen.Channel28
1309-1.Hydrocarbon.Raw1SecValue	1309-3.Oxygen.Channel29
1309-1.Hydrocarbon.GasChannelStatus	1309-3.Oxygen.Channel30
1309-1.TemperaturePressure.Temp01	1309-3.Oxygen.Channel31

1309-3.Oxygen.Channel32	1309-3.Hydrocarbon.Channel34
1309-3.Oxygen.Channel33	1309-3.Hydrocarbon.Channel35
1309-3.Oxygen.Channel34	1309-3.Hydrocarbon.Channel36
1309-3.Oxygen.Channel35	1309-3.Hydrocarbon.Raw1SecValue
1309-3.Oxygen.Channel36	1309-3.Hydrocarbon.GasChannelStatus
1309-3.Oxygen.Raw1SecValue	1309-3.TemperaturePressure.Temp13
1309-3.Oxygen.GasChannelStatus	1309-3.TemperaturePressure.Temp14
1309-3.CarbonDioxide.Channel25	1309-3.TemperaturePressure.Temp15
1309-3.CarbonDioxide.Channel26	1309-3.TemperaturePressure.Temp16
1309-3.CarbonDioxide.Channel27	1309-3.TemperaturePressure.Temp17
1309-3.CarbonDioxide.Channel28	1309-3.TemperaturePressure.Temp18
1309-3.CarbonDioxide.Channel29	1309-3.TemperaturePressure.BarometricPressure3
1309-3.CarbonDioxide.Channel30	1309-3.GasChannelStatusAck.O2
1309-3.CarbonDioxide.Channel31	1309-3.GasChannelStatusAck.CO2
1309-3.CarbonDioxide.Channel32	1309-3.GasChannelStatusAck.CHx
1309-3.CarbonDioxide.Channel33	
1309-3.CarbonDioxide.Channel34	SamplingSequence.Channel101To12
1309-3.CarbonDioxide.Channel35	SamplingSequence.Channel113To24
1309-3.CarbonDioxide.Channel36	SamplingSequence.Channel125To36
1309-3.CarbonDioxide.Raw1SecValue	
1309-3.CarbonDioxide.GasChannelStatus	Combined.SamplingChannelControl
1309-3.Hydrocarbon.Channel25	Combined.Control
1309-3.Hydrocarbon.Channel26	Combined.1313GeneralCO2Avg
1309-3.Hydrocarbon.Channel27	Combined.1313GeneralO2Avg
1309-3.Hydrocarbon.Channel28	Combined.1313GeneralCHxAvg
1309-3.Hydrocarbon.Channel29	Combined.SecsSinceAvgStart
1309-3.Hydrocarbon.Channel30	
1309-3.Hydrocarbon.Channel31	SamplingChannelControl
1309-3.Hydrocarbon.Channel32	OcclusionStatus
1309-3.Hydrocarbon.Channel33	

## 6 Support

### Troubleshooting

*FerMon does not start.*

- Open Windows Event Log, Application Log. If there is an error or warning from FerMon, note the contents and try to rectify the error.
- The configured port (COM1 by default) may not be present on the PC or is being used by another process. Reconfigure if this is the case.
- Note that the OPC server is not meant to be opened by the user directly, e.g. by doubleclicking. It is started automatically when a client connects.

*Items have their quality set to BAD.*

- There may be a communication problem. Check that the BZ6003 PC is connected properly with a high quality (fully wired) cable.
- Check that the BZ6003 PC is running in Measuring mode.
- Check that the BZ6003 PC is configured for remote access using the correct port, and that a 1313 is connected and turned on.
- Try restarting the FerMon PC, the BZ6003 PC, the 1313, and the 1309.

*Item values do not update properly.*

- Make sure the values are supposed to update. Some values may have the same value over long periods of time.
- If callback is used (instead of repeated polling), note that only changed item values are reported.
- Make sure the BZ6003 PC is connected properly and in Measuring mode, and is correctly displaying the values in question.
- Make sure the OPC Private Group, if used, is activated with an appropriate update rate and deadband.

*FerMon does not appear in the list of registered OPC servers.*

- FerMon has the ID "SoftwareConsult.FerMonOPC.1", so please double-check that it is not in your list of registered servers.
- FerMon may not have been registered properly on the PC. Reinstall FerMon.
- If problem persists, locate FerMon.exe and run it from the command line by typing  
`FerMonOPC.exe /regserver`

*FerMon's splash screen says it is limited to three hours even though I purchased a license.*

- FerMon uses a hardware security dongle which must be inserted in a USB port to remove the three hour demo limitation. Please remove and reinsert the dongle, then restart FerMon.
- If the hardware security dongle was inserted before installing FerMon, please contact Software Consult for support.

*FerMon shuts down after three hours.*

- In demo mode, FerMon only runs for three hours before it shuts itself down. To remove the limitation, please purchase FerMon to receive a hardware security dongle.
- If you have purchased FerMon, please make sure the dongle is properly inserted.

*OcclusionStatus does not indicate when occlusion has occurred.*

- Make sure the PMD-1208LS is connected to the PC running FerMon, and that the green light is lit.
- Check the voltage of the 1313 unit's occlusion signal relay, and make sure it exceeds the Voltage Threshold setting.

## Known issues

These are the known issues at the time of release:

- BZ6003 cannot calibrate and communicate at the same time. If using remote calibration, make all OPC groups/tags inactive before starting the calibration, in order to avoid flooding BZ6003 with update requests (which may eventually cause BZ6003 to fail).
- There is no input control for write-enabled tags, so whatever value is entered is sent directly to BZ6003. Note that some invalid or out-of-range values may cause BZ6003 to fail.

## Who to contact for support

Are you having problems with:

**Innova instruments or BZ6003 software:** Please contact Innova AirTech Instruments.

**SCADA system:** Please contact your SCADA system manufacturer.

**USB 1208LS analog measurement device:** Please contact Measurement Computing.

**FerMon OPC Data Server or hardware security dongle:**

Please contact:

Software Consult  
Jordbrovej 6, 2. th  
DK-8200 Aarhus N.  
Denmark

Phone: (+45) 46949894

Website: [www.softwareconsult.dk](http://www.softwareconsult.dk)

Email: <mailto:info@softwareconsult.dk>

We will be happy to assist you.