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# 1. MARKETING AND FUNCTIONAL SPECIFICATION

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## 1.1 Introduction

**The OilPro Oil Management System, Version 4** is a modular system used in oil dispensing environments (e.g. workshops) to improve oil delivery, usage and record keeping through optimized procedures for management and control.

**The OilPro Oil Management System** controls the flow of oil / other fluids from bulk tank to dispensing point / bay while keeping comprehensive records of all transactions. It enables the workshop manager to have control over bulk oil usage, to prevent oil loss and to have comprehensive records at hand for the sake of accountability.

On instruction (by authorized users) the OilPro System shuts oil flow on and off by opening and closing solenoid valves installed at the dispensing bay. A pulse meter sends digital signals about quantity dispensed to the OilPro Main Controller Unit, and this information is stored in a database.

The system combines the latest and most relevant technologies in Electronics and Information Technology, thereby addressing the dynamic challenges of the Information Age. In doing so, the product is favourably positioned as a leader in its field.

The system provides control in hand – from **oil dispensing, integration** with dealer management software ordering, **central management planning, remote control** and **record keeping**.

The OilPro Oil management System Version 4 Hardware was released in August 2005. The Version 4 Software release is planned for October 2006. Version 3 Software is well established in the market and works seamlessly together with the Version 4 Hardware.

## 1.2 Application

The OilPro Oil Management System, is installed and in use in vehicle workshops, ranging from service stations to dealerships with large service workshop areas. The system has also been adapted for use at heavy vehicle (truck) workshops, transport companies, mining concerns and vehicle assembly plants. The OilPro Oil Management System is designed for use indoors ; exposure to weather/rain/water should be avoided.

## 1.3 Features and Product Description

**The OilPro Oil Management System, Version 4** is highly customizable, to cater for specific workshop conditions and requirements. The different components that make up the OilPro Oil Management System is described in the Technical Specification.

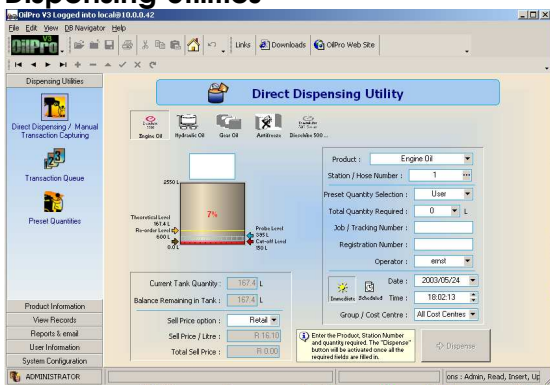
### **The OilPro Oil Management System Version 4:**

- ❑ delivers specified quantities of oil from one or more **bulk tanks to mechanic bays /dispensing points**, while keeping accurate records of all transactions. A variety of reports (user customizable) can be generated and printed out.
- ❑ is an effective **loss control** system, providing protection against unauthorized dispensing of oil products;
- ❑ is designed as a **modular network-based** system, which allows for Internet enablement and for object-based / 'plug-and-play' installation and maintenance procedures;

- ❑ is fully **configurable** and **scalable**. Particular attention has been given to ease of use and ease of installation. See technical and functional specifications.
- ❑ can integrate with industry specific **dealer management/accounting software** packages, while maintaining its own database. The system provides for **independent keypad operation** and **simultaneous use**. The keypads operate as terminals for the main system, enabling dispensing at any point from any keypad. More than one point can dispense at the same time. Should a keypad be damaged, the system or the other keypads will not stop working;
- ❑ makes it possible for the system to send information via **e-mail or SMS** to a manager or supplier, providing remote management possibilities;
- ❑ is enabled to provide an **automatic ordering** system. This means that delivery routes for suppliers can be planned using information supplied on a consolidated basis by OilPro oil management systems, installed on various sites; and
- ❑ carries a one year **warranty, and** a warranty against **damage caused by lightning**. (Repairs or replacements are carried out for free at the OilPro factory.) The product has proved to be less prone to be damaged by lightning, because of built-in protection. It also allows for localization of errors / faults because of the low level modular design.

## Software Specific Features: (Per screen heading)

### Dispensing Utilities



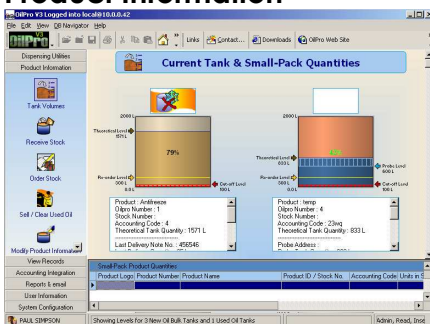
To enter transactions manually: This feature can be used when oil usage has not physically passed through the system hardware. (e.g. a drum of oil was bought and sold on, without pumping oil directly from it, using the Oilpro System.)

The transaction queue database can be viewed. Pre-set quantities may be set up in the software so that dispensing actions are made easier.

#### Options are:

- Direct dispensing / manual transaction capturing
- Transaction queue
- Pre-set quantities

### Product Information



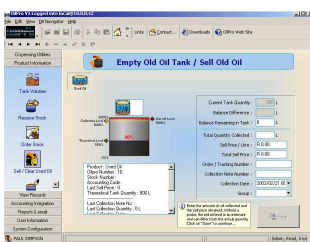
The actual and up-to-date tank levels are shown graphically and are updated every 20 seconds.

When oil is added to the bulk tank, the tank level will rise. (User have to enter the amount of oil received from the invoice) When oil is pumped through the system, the level will drop.

The screen can also be set up to show the old (used) oil tank level.

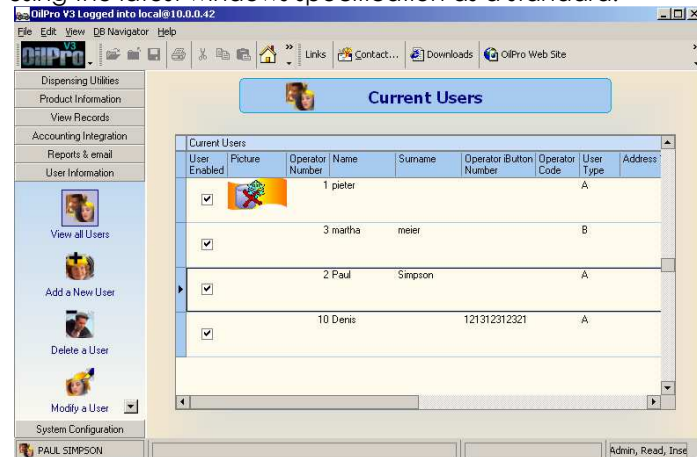
#### Options are:

- Show Tank levels
- Receive Stock
- Order Stock
- Sell/Clear Used Oil
- Modify Product Information
- Add a new product
- Remove a product



## User Information

Task operations, for example "add user" or "delete user" are carried out using easy, wizard-based operations, with systematic instructions. The software design uses a graphical, user-friendly look-and-feel, using the latest windows specification as a standard.



### Options are:

- View all users
- Add a new user
- Delete users
- Modify users

## Multi-user capability

More than one user can view information and operate the oil dispensing system from more than one computer on a network. A multi-user software license is available for purchase.

## Security

See Technical Specification for the security measures built into the OilPro Oil Management System.

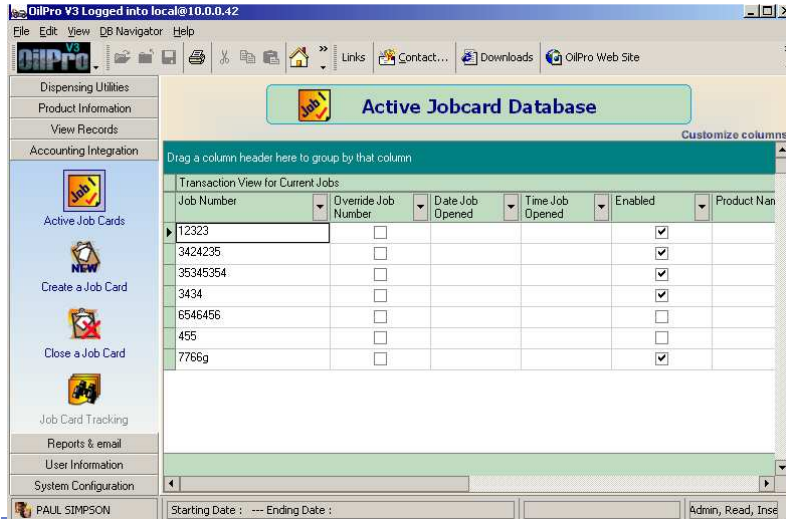
## Integration with accounting / dealer management software

In order to help manage information in the workshop environment and to ensure that duplication of work is avoided, OilPro has teamed up with financial software vending companies to develop integration software. Transactions that are entered using **the OilPro Oil Management System Software** are queued to be imported directly into the accounting software, making manual entry of transactions unnecessary.

The workshop manager or user of **the OilPro Oil Management System** can keep track of the process of integration, as it is happening.

Information about the date that a transaction went through from the OilPro System to the accounting dealer management software, the quantity on the invoice and information about transactions waiting to be processed is available to the system user.

The information about the integration process is stored in the OilPro database. Support for different costing - centres, is available in OilPro Version 3 software.



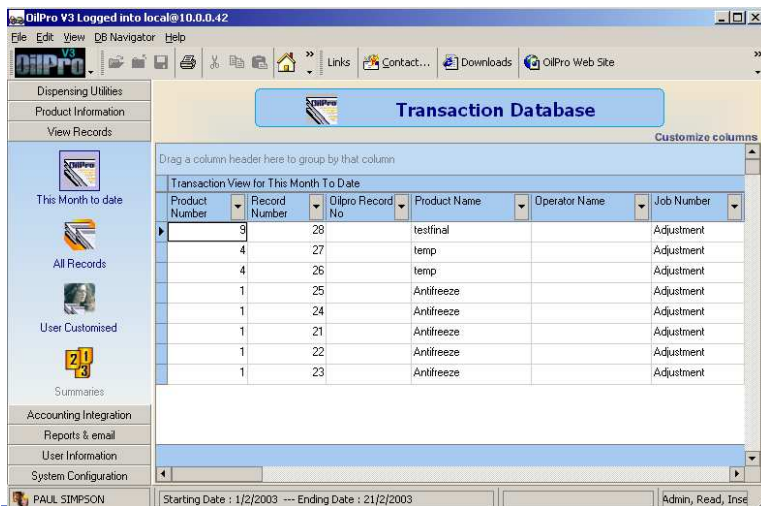
**Options are:**

- View active job cards
- Create a job card
- Close a job card

**Reporting facility:**

The OilPro Version 3 software allows reports to be generated on a *scheduled* basis. For example: a manager can set the system to send him/her weekly e-mails, containing summaries of the week's oil dispensing and use.

The supplier can set **the OilPro Oil Management System Version 4** to send him warnings when tank levels are running low. This can be done via SMS to his/her cell phone, or by e-mail.



**Report Options are:**

- View transactions of this month to date
- View all records
- User customized reports (comprehensive filter allowing users to draw individually customized reports.)

The OilPro transaction database stores information in **45 fields**.

### 2.1 Objective

The objective of this specification is to set out the technical details of the OilPro Oil Management System.

### 2.2 Audience

The audience for this specification includes:

- OilPro Developers
- Testers
- Manufacturers
- Project owners
- OilPro Distributors (installers)
- 3rd Party Interested Persons – (e.g. integration software) developers
- Workshop personnel using the OilPro Oil Management System

### 2.3 Related Documents

Please refer to the following documents for more information:

- Contractor Checklist
- Computer Checklist
- OilPro Wiring Guide
- Installation Instruction Sheets and Software Installation and User Manual
- OilPro General Information and Software Brochures

### 2.4 Components



#### OilPro V4 Controller

##### Dimensions:

397mm (height) x 348mm (width) x 177mm (depth)

#### 2.4.1 OilPro Main Controller Unit, consisting of

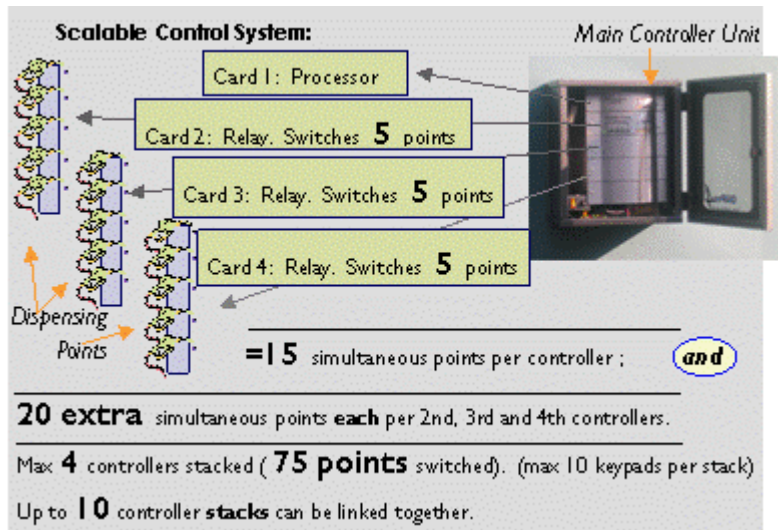
- 4- and 2-Card Controller Chassis Boxes (Metalwork)
- Chassis Printed Circuit Board
- Processor Card
- PC and Keypad connecting Printed Circuit Board
- Relay Cards
- Solenoid and pulse meter connecting Printed Circuit Board
- Power Supply

Firmware and Printed Circuit Board Design by Electronic Art Display CC.

The Main Controller Unit is **customizable and can be extended for extra functionality** – A maximum of **3 Relay cards** can slot into each controller unit with a Processor card and can switch up to **15 points**. Up to **4 controllers** can be “stacked” together with only one Processor card needed and accommodate up to 15 Relay cards (switch 75 solenoid valves).

The system is **scalable**– A maximum of 10 Controller stacks can be linked together. Up to 10 zones can pump simultaneously per controller.

See diagram below:



**OilPro V4 Keypad  
Dimensions (without  
mounting plate):**

195mm (height) x 100mm  
(width) x 40mm (depth)



## 2.4.2 OilPro Keypad

- One keypad can service all dispensing points linked to the system.
- Use of Keypads are **optional**, since manipulation /transaction entering can be done via the OilPro software (see configuration options). The OilPro Keypad is used for **data input**. All the processing is done with the OilPro Main Controller Unit.
- More than one keypad can be provided and will work simultaneously.

## 2.4.3 OilPro Software

Programming languages used for the development of the OilPro V3 Software: C and Delphi.

Data base technology used: Nexus DB. Refer to Functional Specification for information on what the OilPro Software can do.

The OilPro Software consists of **two programs**:

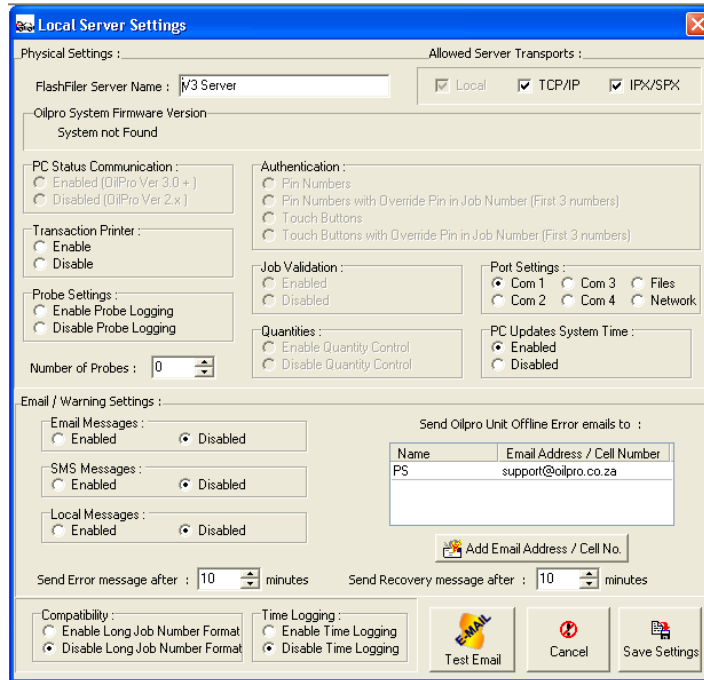
### The OilPro “Client”

The OilPro Client a user friendly database “viewer” and is used to view and input information. This includes all the dispensing transactions, user information, tank information, active- and closed job cards and any software settings. The users that are selected to be **administrators** can set up and edit any users on the system, update tank levels when new oil is delivered and also create a job card that can be used to dispense oil. The OilPro Client acts as the intermediary between the database and the OilPro Server Engine. Refer to the Functional Specification section for more information. The OilPro client can be loaded onto multiple computers on the customer's network, if a multi-user license is purchased.

## The OilPro “Server Engine”

This program is loaded on the main computer on the network. When the computer is switched on, the Server Engine is started automatically. This program handles all the communication between the OilPro Main Controller Unit and all the computers on the network that has the OilPro Client installed on them. With the Server Engine, the local settings of the system can be changed and access a virtual keypad from the computer that has the same functionality as a normal keypad.

The system can be optimized according to the site requirements by selecting the different Warning settings, Authentication settings etc.



The OilPro Oil Management System Version 3 software can be installed on a computer with the following minimum specification:

COMPONENT	MINIMUM REQUIREMENTS
<b>Operating System</b>	Windows 2000 or XP
<b>Central Processing Unit type &amp; speed</b>	Pentium 450 MHz Celeron or higher
<b>Hard drive space</b>	Help files etc 200MB
<b>Memory</b>	64 MB RAM
<b>Graphics</b>	800 x 600 x 16k colors (1024 x 768 res. recommended)
<b>CD ROM Drive</b>	Required for installation (software is distributed on CD)
<b>Audio</b>	Not required

For the installation of integration software, the computer specification is as follows:

COMPONENT	MINIMUM REQUIREMENTS
<b>Operating System</b>	Windows 95/98, Windows NT, Windows 2000 or XP
<b>Central Processing Unit type &amp; speed</b>	Pentium 450 MHz Celeron or higher
<b>Hard drive space</b>	650MB
<b>Memory</b>	64 MB RAM
<b>Graphics</b>	800 x 600 x 16k colors (1024 x 768 res. recommended)
<b>CD ROM Drive</b>	Required for installation (software is distributed on CD)
<b>Audio</b>	Not required

**Client Side Specific System Requirements:**

Operating System Windows 98, NT, 2000, XP  
 CPU Pentium 450MHz or greater  
 Hard Drive Space Help Files etc. 200Mb  
 Memory 64Mb or higher  
 Graphics 800 x 600 (1024 x 768 rec.)  
 CD Rom Required for installation

**Server Side Specific System Requirements:**

Operating System Windows 98, 2000, XP  
 CPU Pentium 600MHz or greater  
 Hard Drive Space Min. 15Mb (Dependant on amount of transactions and information in database)  
 Memory 128Mb or higher  
 Graphics 800 x 600 (1024 x 768 rec.)  
 CD Rom Required for installation  
 Port COM port or USB port

**Note:** Always keep in mind that the computer must have enough resources available after installation of any software for file paging and processing. If a computer CPU is running at 90% or 100%, or if a hard drive is full, the computer will not be able to complete task operations and errors will occur.

**Note:** A computer checklist is available on request from Electronic Art Display CC, for contractors/workshops to fill in to determine whether the computer is suitable for installation of OilPro software.

**OilPro / AutoMate Specific Integration Prerequisites:**

The Windows version of the AutoMate Software must be installed on at least one computer on the network. The computer system resources must be sufficient to handle installation and operation of **both the OilPro Oil Management System Version 3** software and the accounting integration software.

If the computer that the OilPro / Automate integration software is installed on, is used for dial-up connection to the internet AND for an internet network connection to a central server, either Windows NT, Windows 2000 or Windows XP has to be used as operating system.



**2.4.4 Touch-buttons (also called i-buttons)**

The Touch-button is a rugged data carrier that serves as an electronic registration number for automatic identification. Every Touch-button is factory lasered with a guaranteed unique 64-bit registration number that allows for absolute traceability. The durable stainless-steel Touch-button package is highly resistant to environmental hazards such as dirt, moisture, and shock. Its compact coin-shaped profile is self-aligning with mating receptacles, allowing the Touch-button to be used easily by human operators as unique identifiers.

## 2.5 Tolerances and accuracy information

The tolerance and accuracy of the OilPro System depends on the type and quality of pulse meters used. The specification sheet of the pulse meters will state the tolerance of the meter. (Generally below 2 % fall-out) Tolerance can be influenced by many factors such as the flow rate, viscosity and temperature of the liquid.

The OilPro System reads the input from the pulse meter 100 % accurately but if there is pulse meter malfunction, the OilPro System will record and report the inaccurate readings. The OilPro V4 system has a built in calibration factor that can be set via the OilPro keypad to compensate for pulse meter error.

## 2.6 Security Issues

The OilPro Oil Management System authenticates users by enquiring them to log on, using an individually assigned username and password, or by using a designated touch button (also called i-Button).

### **OilPro Database**

The records in the database are protected with a password. A user must enter a username and password to access these records.

### **OilPro Software: Client**

The person responsible for the software installation will set up all the users that will be using the software. During the user setup process a user type must be defined and the security level is determined by the user type. An Administrator are able to read, write and edit records in the database from the OilPro Client, whereas a Costing Clerk will only be able to view records on the computer. A mechanic is selected as an Operator and will not be able to work on the computer or software, but only use the OilPro Keypad to enter transactions.

Each user will have an own profile the security level is set according to his/her profile.

### **OilPro Keypad Operation**

From the keypad the mechanics can pump oil with their own touch button or PIN number. The transactions are logged to the system if the job card is available and Job validation is enabled from the OilPro Server Engine. Should the computer be switched off and the mechanics need to pump oil, they will need the administrator's PIN number or administrator touch button, whichever is enabled. The calibration factor is protected with a master PIN and will be set up by an OilPro Technician when the system needs calibration.

## 2.7 Configuration Options

NO	TYPE	DESCRIPTION	REQUIRED	NOT REQUIRED
1.	<b>STAND-ALONE</b> (not recommended)	This configuration is a scaled-down version.	OilPro Main Controller Unit, One or more keypad(s) and a printer. (or ticket-printer)	Computer with OilPro Software installed
2.	<b>COMPUTER-BASED</b>	Control from Computer directly. No manual control via keypads.	OilPro Main Controller Unit Computer and Printer	OilPro Keypads
3.	<b>STANDARD</b> (recommended)	Similar to Stand-Alone unit, except that a computer is required.	Computer with OilPro Software installed, Printer and Keypad(s)	-
4.	<b>OILPRO LIGHT VERSION</b> <b>(Redundant)</b>	Control from computer directly. No manual control via keypads.	Computer and Printer. OilPro LV Controller Unit.	OilPro Keypads

## 3. OTHER EQUIPMENT (also referred to as Ancillary Equipment)

The following equipment is **NOT provided** with an OilPro Oil Management System, but is necessary as part of a full bulk oil system installation:

- **Oil Solenoid Valves:** Oil Solenoid Valves are used to control the oil flow. (to switch oil on and off). An Oil Solenoid Valve must be installed at each dispensing point. Solenoid Valves must be rated to handle the viscosity and pressure of the oil/product being dispensed. Solenoids should be 24 V, AC OR 24 V, DC (do not combine). The solenoids should be able to handle a pressure of 50 BAR, and a viscosity of 400 ~cStokes.
- **Air Solenoid Valves:** An air solenoid valve should be installed at each pump. This valve switches the air to the pump on and off so that the system is not constantly pressurized. Should there be a pipeline burst/leak, fluid spill will be contained to the quantity in the pipeline, preventing the contents of the bulk tank from spilling. An air solenoid valve can be assigned to any free switch (depending on the configuration). Solenoids should be 24 V, AC OR 24 V, DC (do not combine). (If AC oil solenoids are used, the air solenoid valve should also be AC. If DC oil solenoids are used, the air solenoid valve should also be DC.)
- **Non-return valves:** Non-return valves prevent oil from flowing backwards in the oil line. If oil flows backwards in the oil line, the pulse meter might count the same oil twice, causing incorrect readings.
- **Pulse Meters:** The pulse meter sends digital signals to the OilPro System. The OilPro System uses this information to "count" fluid flow. For simultaneous dispensing, a pulse meter must be fitted at every nozzle. Pulse meters must adhere to the following:  
Standard:

**PPL:** 100  
**Flow range:** 1/30 l/m  
**Max Pressure:** 50 Bar  
**Max Load:** 3W

**Viscosity:** 5/2500 mPas  
**Max Current:** 100mA  
**Max Voltage:** 28V

Other:  
PPL:

52 or 35 or 325

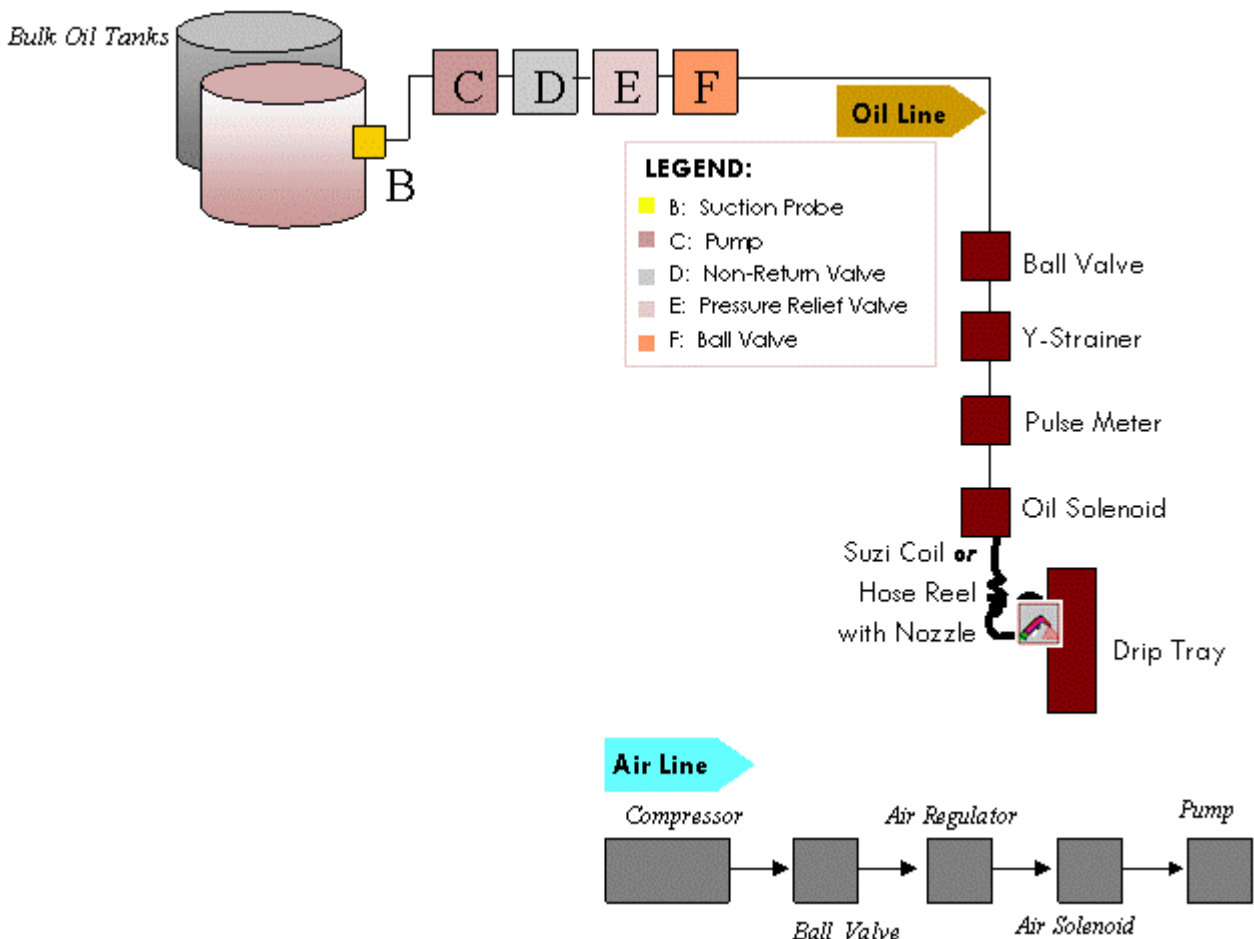
Please contact OilPro to check whether the pulse meter you are intending to use is suitable.

**Wiring:** The solenoid valves are each connected to the Relay Connecting card on the OilPro system via 0.5mm<sup>2</sup> (PVC PVC insulated) cabtyre cables (0.75mm<sup>2</sup> is also acceptable). Each pulse meter must be connected with screened cable to the system as this will prevent any interference from outside the cable that can influence the readings. The same applies for the keypad and computer cables. The keypads and computer are each connected to the system with a separate screened length of cable. Should there be a ticket printer installed, then it must be connected to its nearest keypad. The cable that should be used for the connection of sensitive equipment (PC, Keypad, Printer and Pulsemeter) is 0.22mm<sup>2</sup> OAM (Over-All Mylar) Screened (PVC insulated) cable.

Interference and signal degradation might occur if the screened cable (keypad and computer cable) is longer than 50m. This will result in incorrect readings and incorrect commands sent to and from the keypads(s) and computer. The resistance of the solenoid coils are in the region of 10Ω for AC Solenoid coils and between 30Ω and 50Ω for DC solenoid coils. The length of wire connecting the OilPro system to the solenoids is also to be kept below 80m because all wire has resistance which increases with length, and if the resistance of the wire becomes too much the voltage drop over the cable will cause the voltage at the solenoid to drop and it will not be sufficient to fully magnetize the solenoid coil and thereby open the valve.

A **wiring diagram** is provided with every OilPro System sold.

The following diagram gives an indication of how ancillary equipment should be installed to work correctly together with the OilPro Oil Management System:



- Cable Ties, Plugs, Bolts, Screws, Isolator Plugs, piping, cabling, pumps, bulk tanks, nozzles, oil controls etc are all needed for bulk oil system installations. Refer to the manufacturer specifications for information about these items.

#### 4. SUMMARY OF OILPRO AND ANCILLARY EQUIPMENT

NO	EQUIPMENT	CONFIGURATION DETAILS	QUANTITY	SUPPLIED BY Electronic Art Display CC
1.	<b>Main OilPro Controller Unit</b>	<b>Required</b> Controllers can be linked together	1 Specialized Configuration > 1	<b>Yes</b>
2.	<b>OilPro Keypad</b>	Optional	0 if operated from computer only, otherwise minimum 1.	<b>Yes</b>
3.	<b>OilPro Software</b>	Highly Recommended	1	<b>Yes</b>
4.	<b>Touch Buttons</b>	Recommended	As many as the workshop requires	<b>Yes</b>
3.	<b>Solenoid Valve</b>	Air Solenoid at Bulk Tank, Oil Solenoids at Nozzles	Depends on Configuration	No
4.	<b>Pulse Meter</b>	Required	Depends on Configuration	No
5.	<b>Isolator Plug</b>	Optional	Depends on Configuration	No
6.	<b>Computer and/or Printer</b>	Recommended	Depends on Configuration	No
7.	<b>Ticket Printer</b>	Optional	1	<b>Yes</b>
8.	<b>Wiring, Cable Ties, Plugs, Bolts, Screws, Bulk Tanks, Pipes, Pumps</b>	Required	Depends on Configuration	No
9.	<b>Old oil tank warning switch</b>	Optional	Depends on Configuration	<b>Yes</b>

(This list does not presume to be complete – other equipment may be required for a bulk oil installation.)