



Tough times lead to innovation

It has been a long break between this newsletter and the last one we produced. Our industry has been through challenging times the likes of which have not been previously witnessed in a generation and more, if ever. All companies in the patch have gone through a great deal of change in the last three years and not all had the good fortune to make it through. Our industry has changed for perpetuity and a new dawn emerges on the role that oil and gas will in future take alongside other energy sources.

At Fardux innovation is at the core of our existence and as a consequence and while such progress has been arguably at a reduced level, we have continued to enhance software and hardware to deliver to our clients solutions to meet technological challenges as well as commercial expectations

and in many cases market limitations.

Our product range is probably at its largest level in all of our 30 year history. From our original and still much in demand wired system to WirelessHART and combination Hybrid wired/wireless data loggers. Software development continues and amongst many smaller enhancements we have some new embedded Coriolis measured fluid flow calculation and display functionality that has gained wide acceptance. In the autumn of this year we will be rolling out a brand new set of bit maps to accompany our software to give it a new fresh and up to date look and feel replacing all of the default graphic that we have used since the very beginning.

A couple of years back we started building data logging hardware and software solutions for Hydraulic Workover rigs in parallel

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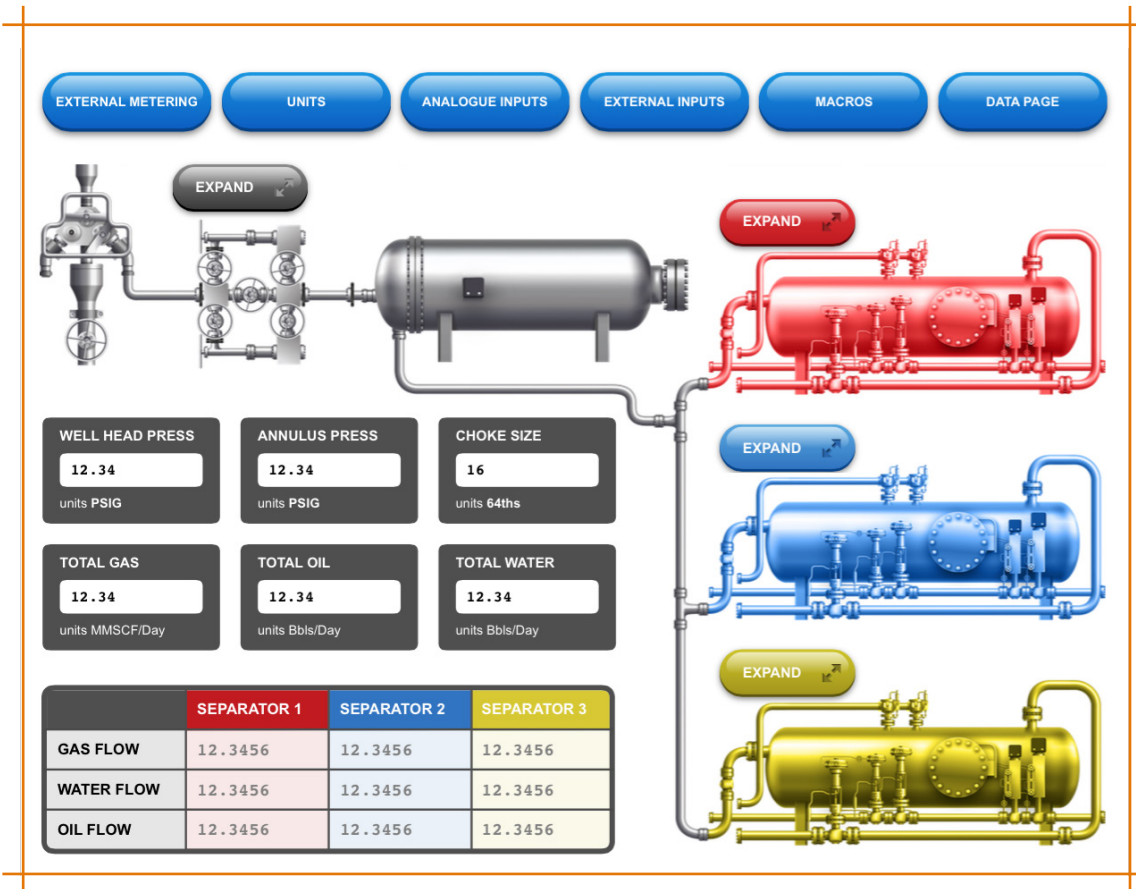
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to our long term traditional production and well testing offerings .This new environment has been technically challenging and at the same time rewarding to be involved with deploying our long term skills into new and exciting situations.

Client engagement and feedback has always and continues to be an important part of our R and D and we continue to welcome your input.

Recently new WirelessHART transducers have come onto the market offering more competitive prices with comparable quality to the long term incumbents. New Flow Totalisers from European manufacturers are now firmly part of our instrumentation offering. What we design and manufacture along with component system parts that we buy in all contribute to technical excellence and have a significant bearing on our commercial competitiveness . At Fardux we have always had an eye on innovation in the market from component parts to the finished system product. Quality has remained central to our strategies and innovations that we have been able to bring to market must undergo rigorous systems and integration and acceptance testing before we roll them out. What our clients always get from Fardux is assured quality and backup support. Everyone can make a mistake, although sometimes the difference between providers can be the frequency of faults and how they are resolved.

In this issue we hope to offer our readers a balance between technology issues and advances to the personal and more human side of our world. It's good to be back with our newsletter... we hope you enjoy the read.

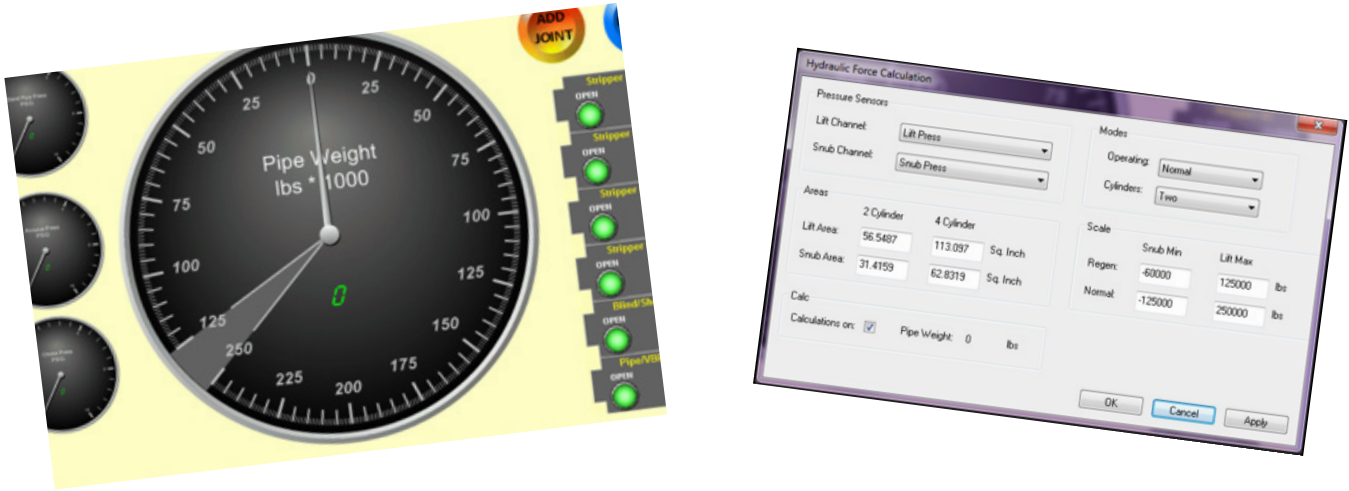


New Schematic Bitmap Designs

HWO Software.

We have a new version of the software specifically designed for HWO (Hydraulic Work Over) Wireless transmitters working with the Fardux Airwave wirelessHART Gateway and software suite then display the application data on a whole new set of bitmaps, these new bitmaps are automatically opened if a HWO dongle is used with the software.

As well as displaying the data we also perform calculations for pipe weight, RPM , flow rates and monitoring Ram positions. The software also includes the plotting and reporting features the same as the standard software.



Hydraulic force calculation is dependent on a few variables. As well as the 2 inputs for lift and snub pressure there are also 2 modes of operation Normal & Regen and a choice of two or four jacks the area of the jack cylinders is also required in order to calculate the correct hydraulic forces.

This hydraulic force is displayed as pipe weight on a digital weight indicator enabling the operator to easily determine a pipe light or pipe heavy situation.



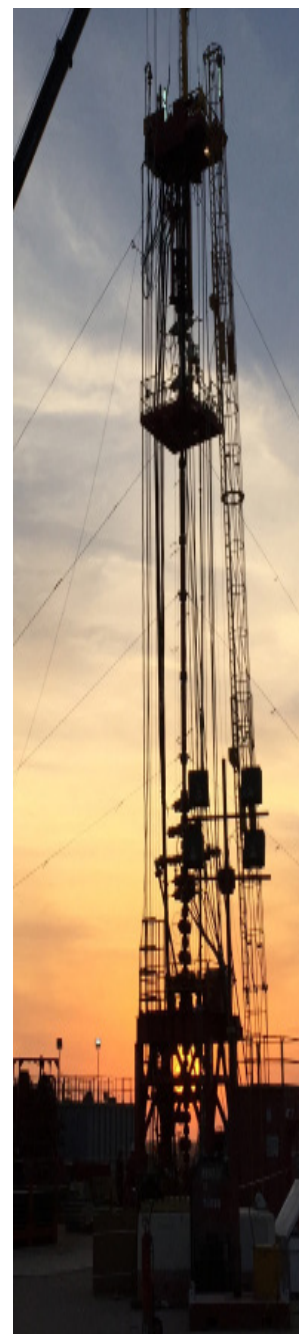
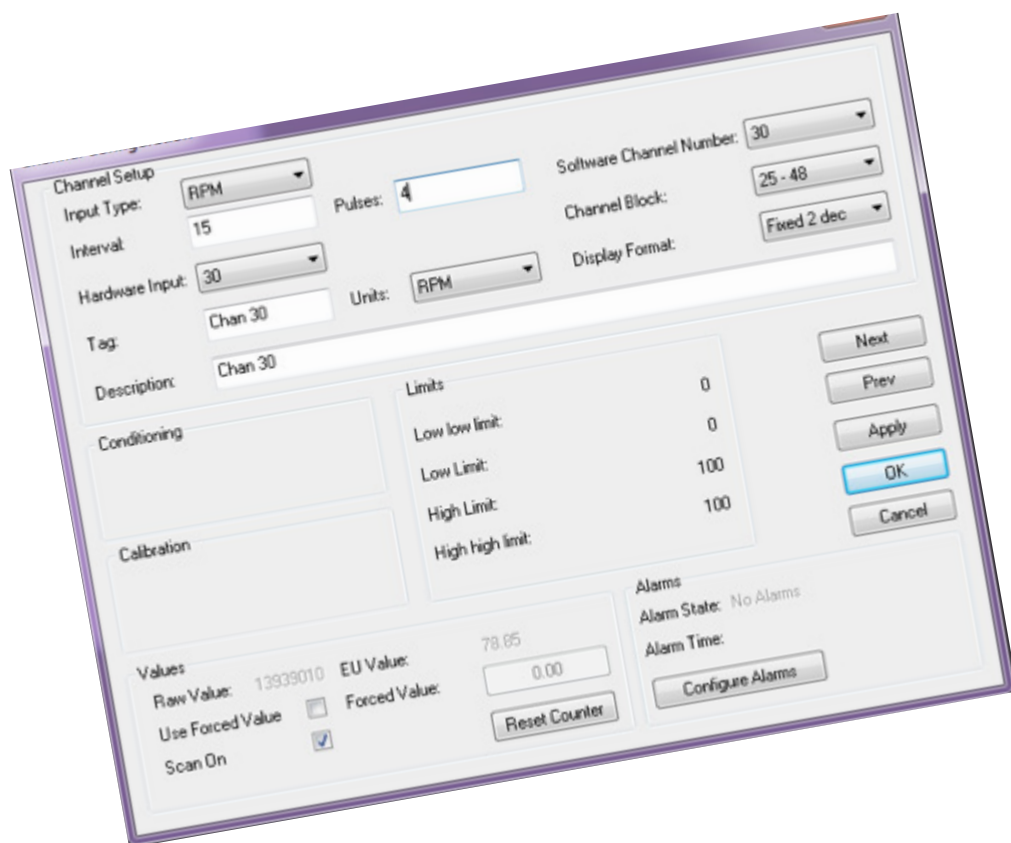
A Pipe inventory dialogue allows the operator to keep a tally of the pipe on location that is to be used for the current job. By adding or removing joints the software is able to calculate the depth of all the pipe currently in the well.

Ram Position monitoring is used to visually display if a ram is in the open or closed position.

There are two methods of detection for the hydraulic rams, either a proximity switch attached to the ram bonnet or by a pressure switch in the hydraulic line.

Using pressure switches negates the necessity to have clamps and cables attached to the rams which can become obstructive when trying to work on the stack especially if the rams need changing to accommodate the bottom hole assembly. RPM calculations are carried out within the channel configuration, the example below shows 4 pulses per revolution of the rotary table and the calculation is being performed every 15 seconds.

RPM calculations are performed using a proximity sensor which picks up a signal from a magnetic tag attached below the rotary.

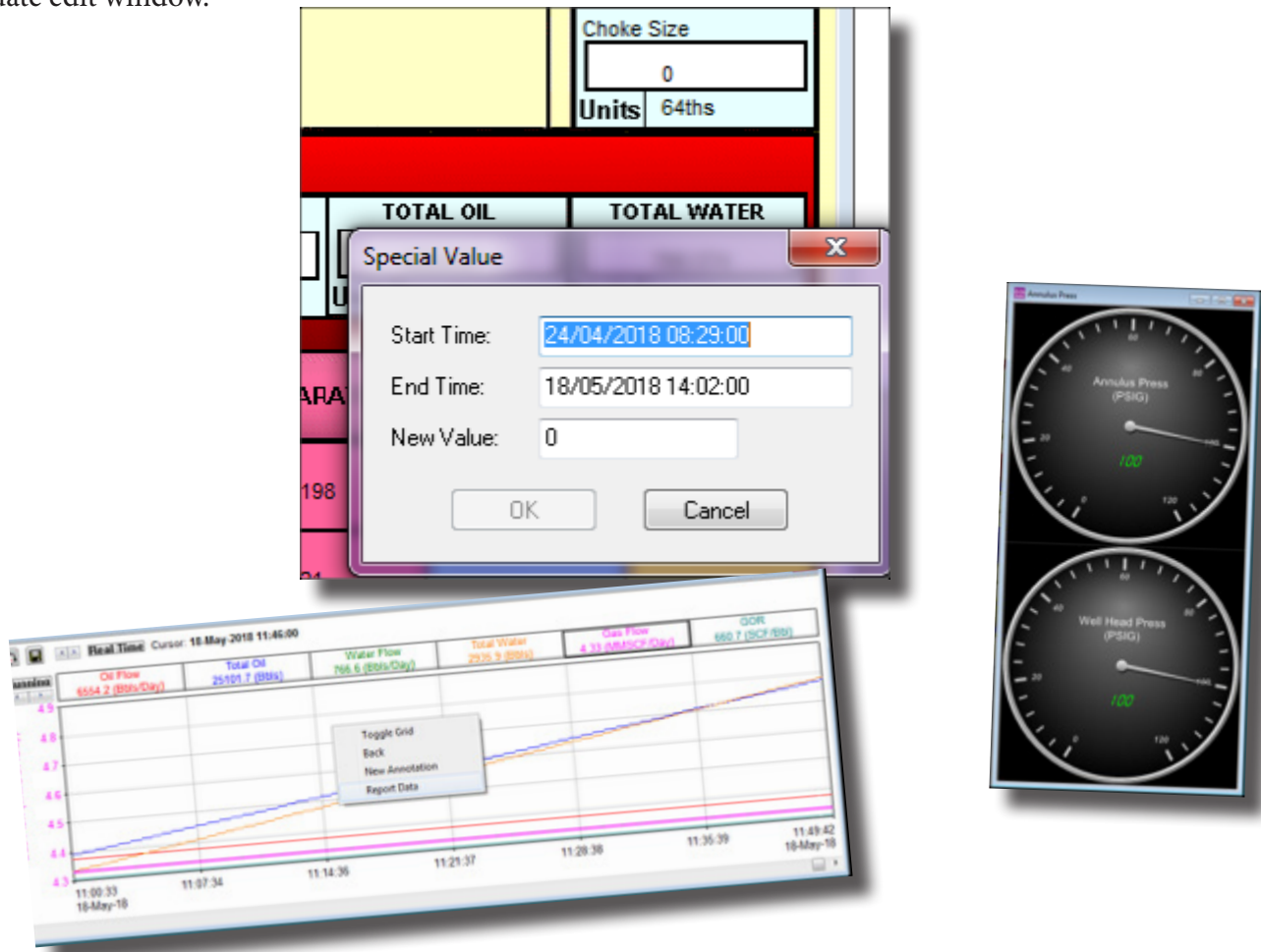


New Software Features

There have been several new releases of software the latest version being 4.8.0.

This includes many new enhancements plus a new version of software that is used exclusively for hydraulic workover rigs.

The new enhancement include:- Data editing directly from the GUI interface, simply select the variable you wish to edit then with the mouse positioned on the value double click with the right mouse button to open the date edit window.



Printing reports directly from a plot screen.

Changing multi plot variables real time saving the time it takes to close the plot window, select the plot setup, change the required variable then reopening the plot and re scaling etc. Dial gauges can now be stacked vertical-ly as well as horizontally.

There has also been a lot of work carried out in the background to add dongle features to the schematic editor, doing this has enabled us to automatically open the correct set of bitmaps depending on the dongle employed. This is especially useful with our new custom features options.

For example if you had a basic IDEA LITE software package and you added the Modbus feature you would not be able to see any Modbus values on the bitmaps as the Modbus shortcut would not be on the home page. You would need to manually edit the home page schematic file and copy the Modbus icon and page from the Enterprise bitmaps in order to see the values.

The software now reads the dongle then sees that Modbus is included and automatically adds the Modbus short-cut to the home page.

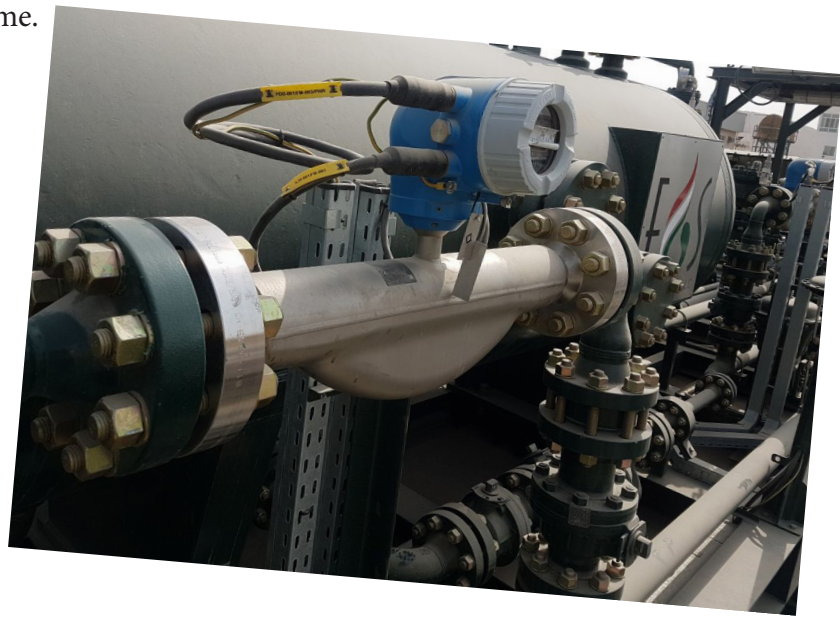
Future Developments

We are currently working on including the Coriolis calculations into the software this will remove the need to program upwards of 20 macros to get Coriolis volumetric flow rates in both 2 and 3 phase scenarios.

We are also working on a new set of bitmap images for all versions of the software, the old images have been around for quite a few years now so it's time for a freshen up and bring them into the 21st century.

As always if you have any suggestions on future enhancements you would like to see included in the software then contact us and we will add your suggestions to our database.

A considerable proportion of the enhancements we include in our software come from the operators in the field, so your suggestions are always welcome.



WirelessHART Transducers and Battery Life

Wireless data acquisition systems have been around for several years now and their place in the DAC market is, while not the be all and end all, undeniably here to stay .

In the early days of wireless devices battery life was not top of the technology considerations and duration expectancy was as a consequence not great. Part of the reason for this was the transducer circuitry was still of the legacy analogue generation and power hungry. Some companies tried to offer digital output radio modules to bolt onto smart generation transducers although power consumption of these devices was so high that battery replacement was at a frequency and cost beyond which the market was prepared to bare..

Fast forward five years and a new generation of integral wirelessHART transducers have come to market with extremely low power consumption. In parallel with these developments new battery technology now means that with one minute sampling , duration expectancy of six months plus can be achieved.

IATA shipping regulations for lithium batteries remain a major headache around the world although with increased life expectancy , battery management and stock level maintenance is less of a challenge than it once was .

Innovation moves on pace with more major instrumentation providers entering the WirelessHART market. Where this arena was once dominated by a single player others have now emerged to drive this technology forward. All players are still from Internationally recognised brands for instrumentation which ensures that quality of measurement , accuracy, repeatability and stability are maintained. The wirelessHART fieldbus foundation is the protocol standard upholder although we have come across many incompatibilities between companies and between products in a given range of devices in a single company . Part of what we do at Fardux is to ensure that what we offer our clients by way of instrumentation has been compatibility tested with our WirelessHART gateway so that you don't have to worry about what will connect and what will not.

About Wellwise Group

Fardux has always been part of the Wellwise Group of companies.

Other companies in the group consist of Wellwise Oilfield Services Limited, and Proteus Well Services Limited who supply skilled personnel to the oilfield industry.

WWG have an extensive portfolio of experienced technicians who are available for both land and offshore assignments, offering a wide range of highly skilled personnel to service companies on a global basis. WWG understands oilfield requirements which range from short term ad-hoc jobs to long term rotational projects. Quality systems are embedded at the very core of Wellwise Group's delivery including ISO 9001, 14001 and OHSAS 18001. We are an SQA training Centre and run an SQA Approved Competency Scheme for ten Oilfield Disciplines.

Wellwise Group offer a cost effective solution for all your contract personnel needs. From a simple Nitrogen purge to a complex Well Testing Package or Data Acquisition job.

WWG have contract technicians ready to work immediately in the following areas:



- Well Testing
- Slickline
- Sub Surface Tools (Ocean Floor)
- Data Acquisition (Surface and Downhole)
- Drill Stem Testing
- Completion
- Well Services Supervision
- Coiled Tubing
- Pressure Pumping Services
- Fluid and Nitrogen Pumping Services
- Bolt Tensioning & Flange Management
- Process and Pipeline Services
 - Leak Detection
 - Pressure Testing
 - Purges
 - Pigging
 - Flooding

For more information please go to our website. www.wellwisegroup.com.

DAY IN THE LIFE – Kumanan P.

Fardux often works alongside manufacturing integrators. While some are solely oil and gas focused, others have a diverse range of expertise. This sector is very prolific within the United Arab Emirates, especially Dubai. In this article, we look at a typical day of one such company – Al Shirawi.

Question: Could you please tell us your name and job title

Reply: Hi, I am Kumanan P. The Sales & Business Development Manager for Al Shirawi.

Question: Where are you located?

Reply: Our main manufacturing location is in the Industrial Area of Al Quoz in Dubai.

Question: Could you tell us a little about the background of the company?

Reply: Al Shirawi Equipment Co. L.L.C (ASECO), is the manufacturer of an array of Atlas brand equipment which was established in Dubai in 1976. ASECO designs and manufactures products for the Upstream and Downstream oil industry sector.

Two additional facilities in Dubai and a satellite operation in Oman provide significant manufacturing capacity with total built up area of over 60,000 m² along with open work area of over 100,000 m². The two major plants have complete end to end capabilities for their product lines with all fabrication, assembly, packaging, testing, painting and coating all done in-house.

Question: What is your speciality within the group?

Reply: My particular speciality is Well Testing. I follow each project from the initial inquiry through to delivery. However, as a company we provide solutions for both the onshore and offshore upstream segment. These include products like Cement Silos on Skids and Trailers, Tripods, Frac Tanks, cement bulkers, batch mixers, three phase separators, metering skids and Manifold diverter's. Our mission was and remains the delivery of uncompromising quality in heavy equipment manufacturing, at an optimum price.

Question: Who are your main clients within the oilfield sector?

Reply: We have a huge portfolio of clients. Current ones include Schlumberger, Halliburton, Emerson, Pentair, NPS, Occidental Petroleum, PDO Oman, and ADCO in Abu Dhabi to name a few.

Question: How can Fardux products integrated in your manufacturing process?

Reply: Quite often we are approached to provide a complete solution for our clients. In the case of Well Testing, that typically means a main trailer package which has a separator, choke and tank. This is for use in zone I. The second package is the support trailer with lab, power generators, air compressor and workshop. This can be built for either a safe or zoned area, depending on the client requirements. The Data Acquisition System (DAS) is either wired, wireless or a hybrid. By integrating the Fardux DAS system during the build and commissioning, we are literally offering a Plug-and Play solution at the time of delivery. It also saves time and cuts costs.

Question: How long have you been working with Fardux and what new technologies have you seen being introduced?

Reply: We have been working with Fardux for several years now and have a very good working relationship. On the technology side, well it is constantly changing. For example we have seen an uptake in inquiries and orders for the integration of Coriolis meters. This has meant a shift away from the traditional turbine flow meters used for oil and water measurement. It has also meant an equal shift from Daniels gas metering as reliability, accuracy and acceptance of Coriolis metering becomes the industry standard. Fardux has recently integrated the Coriolis calculations with their software to bring technology to the forefront. It is really about giving clients an informed choice, and that has been combined companies' strength.



Question: Where do you supply your products and services?

Reply: Most of our clients are from the MENA region. However we manufacture and supply on a global basis, with the exception of UN sanctioned countries.

Coriolis Meters

It seems that coriolis meters are becoming ever more popular additions to Welltest separators especially newly built equipment; we have also seen coriolis meters being retro fitted to existing equipment.

With no moving parts, coriolis meters require less maintenance than mechanical meters, which reduces personnel exposure to the process for servicing calibrating and the turndown ratios are such that one size of meter will cover a large flow rate range.

The other main advantage of a Coriolis meter is that it provides a true mass flow reading. And as its output is directly proportional to mass flow rate there is no need to compensate for temperature and or pressure.

The general formula to convert a mass flow to a volumetric flow is:-

$$\text{Volume} = \frac{\text{Mass}}{\text{Density}}$$

In the above formula density is corrected to standard conditions to give a corrected volumetric flow rate. Many manufactures state accurate density readings as a USP however this is only true with a single phase fluid, where an oil line on a welltest separator is concerned there will always be entrained gas and in most cases some water will be present, therefore Fardux still recommend that manual density reading for oil are still used in order to obtain an accurate flow rate, and of course regular meter factors are still a must.

The other advantage is there is only one meter/transducer for each flow rate so this frees up channels normally used for Gas static, differential and temperature sensors and oil line temperature and in most occasions the 3 or 4 turbine meters, this could result in a cost saving as a 12 channel logger may now be sufficient for the job whereas before a 24 channel would be required.

Fardux have now also integrated the Coriolis calculations for oil, water and gas into the software and this is now a standard feature on the Enterprise software and an available option on all other software. This negates the necessity to create up to 20 complex macros to convert mass to volumetric flow in for both 2 and 3 phase flow options.

The output from the Coriolis transmitters is the most important consideration if the data from the Coriolis is to be integrated into the idea software. There are 3 main outputs available from a transmitter:

- . 4-20mA
- . Wired Hart
- . MODBUS.

There are advantages and disadvantages to all 3 options and the final decision often depends on the particular output data required from the Coriolis.

4-20mA

Normally a single output which will be used for Mass flow.

The critical consideration when selecting 4-20ma is to ensure the output is Isolated and Intrinsically safe, otherwise we cannot loop power it from a LITE or ENTERPRISE cable system.

Wired HART

Uses the same output as the 4-20mA and the hart signal is super imposed on to the 4-20mA loop.

However with wired HART we can read 4 variables from the Coriolis, the Primary (1), secondary (2), tertiary (3) and Quaternary (4).

The Fardux CUBE can be used to read wired HART data however there are now 2 major considerations to take into account. Firstly the output must be Isolated and intrinsically safe and more importantly is the ability for all connected transmitters and transducers to multi drop onto the HART loop without causing data dropout.

MODBUS 485

Modbus 485 is the final data output option, however MODBUS is not an intrinsically safe signal and this requires armoured cable and a safe area interface box to convert the individual signals from each transducer into a readable data stream that the Fardux IDEA software can interpret.

The major advantage of Modbus is the unlimited amount of data that can be read from the Coriolis.

The obvious disadvantage is the addition cost of armoured cable and interface boxes.

There have been occasions when we have been contacted by clients who have already purchased coriolis meters with a particular model of transmitter hoping that the data can be interfaced with our software, 99% of the time we can do this, but the cost of retrofitting a system is often a major surprise.

In order to avoid unnecessary installation cost and the necessity of custom built solutions we recommend contacting your nearest Fardux representative to discuss your requirements and we can then advise on the best transmitter and manufacturer based on data requirements and the architecture of the data acquisition communication options.

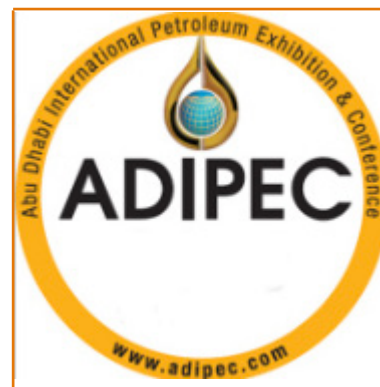
International Trade Shows and Conferences

Fardux has a global reach and clientele to match. So it is important for us to meet our customers whenever possible. For this reason we have been attending the Offshore Technology Conference (OTC) in Houston Texas for many years. This year it took place from Monday, 30th April to Thursday, 3rd May 2018.

It has proven a great place to showcase our new hardware and software offerings, whilst interacting with clients to exchange ideas and opinions and to discuss technology advances. Our hybrid logger the Cube, is a good example.

2018 was certainly busier than in recent years, perhaps a clear sign that the industry is slowly pulling out of the worst recession in many decades. So there was good reason to be upbeat, especially as OTC was celebrating 50 years since its inception in 1969.

If you missed out meeting us at OTC then perhaps the Abu Dhabi International Petroleum Exhibition and Conference (ADIPEC) is a little closer to home. ADIPEC has grown exponentially to become the world's meeting point for oil and gas professionals and will be held this year from the 12th – 15th November 2018. So please come and visit us at stand 4374 in Hall 4.



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