ISSUE 002 | September 2017

Review

Inside review

Slope Indictors for off-highway vehicles

P04

Machine Building
Bespoke Machines

P12

APPLICATION

Underwater Position

Global Civil Engineering company reflects on underwater challenges

SAFETY

Slope Safety

We take a closer look at devices for slope safety on off highway vehicles

APPLICATION

Modern Steel

Position challenges in UK steel manufacturing

Contents

SEPTEMBER 2017 | EDITION 2 | EMOLICE DISTRIBUTION

Features

Case Studies

New Products

Other editorial

Contact Us

Address: Emolice Distribution Limited

Ocean House | The Ring | Bracknell | RG12 1AX

Tel: +44 1344 266530

Email: sales@emolice.com

Twitter: @emolice

Linkedin: www.linkedin.com/company/emolice-distribution

"Safety First" | P04

Underwater

Challenges of underwater tilt measurement

Underwater | P08

Modern Steel | P10

Guest editor

IT continues to be a busy year at Emolice ! Following on from a strong start to 2017 we have been privileged to be invited to share our applications and engineering expertise with some leading companies on some fantastic projects.

Mobile machines and their applications continue to feature strongly so far this year. We're delighted to have launched our latest new product, the Si-1, designed and manufactured by the team at Emolice Technology in the UK !

The interest in our Elgo lift portfolio has also continued to grow and we are starting to see more and more interest in the LIMAX range for new lift installations and modernisation projects. We've announced the latest LIMAX product in this issue !

We've got some great insights in this issue - I hope you enjoy reading them as much as we have enjoyed pulling them together for you!

Emily Quinn
Emily heads up our customer service team !

In this issue...

editors top picks from this edition

Safety First

NEW ARRIVALS:
The EMOLICE Si-1 Slope Indicator for Off Highway Machines

Tough TILT

Slope Indicators lead the way in reducing accidents caused by operators exceeding maximum tilt angles of machinery

AVAILABLE FROM
Emolice Technology, or visit www.emolice.com

PRICE
• POA

OUR RATING

★★★★

THE GOOD
Purpose designed slope indicator for retrofit or new machines. Designed & tested with a leading groundcare equipment suppliers.

NOT SO GOOD
Only available from a limited number of outlets - for now !

Operating off-highway machines can be dangerous, with many documented cases of operators overturing machines and causing serious injury and even death. Despite an ever increasing focus on health and safety through the adoption of risk assessments, method statements and safe working practices, accidents still happen.

Owners of off-highway machines have a duty to ensure that their operators are provided with clear indications that they are using the machine within the safe operating limits prescribed by the manufacturer.

With UK Crown Courts having recently imposed fines and costs of over £40,000 for a single breach of Section 2(1) of the Health and Safety at Work Act where an overturned mower resulted in death of the operator, the message is clear; owners need to do more.

To help address the safety challenges faced by machine owners, Emolice worked closely with some of the countries leading agricultural and groundcare equipment suppliers to local councils, commercial and agricultural users. The result was a purpose designed and built audio visual warning device that can be either retrofitted or used on new off-highway machines such as mowers, tractors, excavators and other machines where there is a risk of the machine overturning on gradients.

Comprising an integrated dual axis

PROS/CONS

- Purpose designed audio visual warning device for new machines or simple retrofit to existing machines.
- Currently only available as an aftermarket accessory or through dealer networks.

tilt sensor, the Emolice Si-1 slope indicator measures the operating angle of the machine in realtime for both pitch (front to back) and roll (side to side). The realtime tilt measurement is shown on two high intensity LCD screens that are visible in both low light and bright light conditions.

UK Courts have imposed fines and costs of over £40,000 for a single breach of Section 2(1) of the Health and Safety at Work Act resulting in death or injury caused by an overturning mower

Designed to be configured at the time of installation, the Emolice Si-1 is programmed with the maximum operating angle of the machine. The maximum working angle and all of the other Si-1 settings cannot be changed by the operator.

Whilst the machine is in use, the operator will receive a visual (orange LED) warning when the operating angle of the machine reaches 75% of the maximum working angle.

When the maximum working angle of the machine is exceeded, the operator receives an audible alarm and visual (red LED) warning. Additionally, the relay is triggered, cutting power to any connected attachments or accessories.

For machines where remote angle measurement is required (for example tractor mowers or tow mowers) the Emolice Si-1 offers an external sensor option allowing the tilt sensing to be performed remotely from the Slope Indicator.

In addition to the angle measurement and alarm functions, many of the other features of the Si-1 are testament to the expertise of our partnership with some of the countries leading agricultural and groundcare equipment suppliers.

For example, an automatic self test at power up ensures that all visual and audible indications are working which helps owners and operators ensure compliance with the Provision and Use of Work Equipment Regulations (PUWER) 1998

Additionally, the Emolice Si-1 incorporates a 10-30V DC Protection Circuit to protect from voltages spikes as high as +60V and negative voltages as low as –40V that can often be seen when switching, moving or lifting attachments.

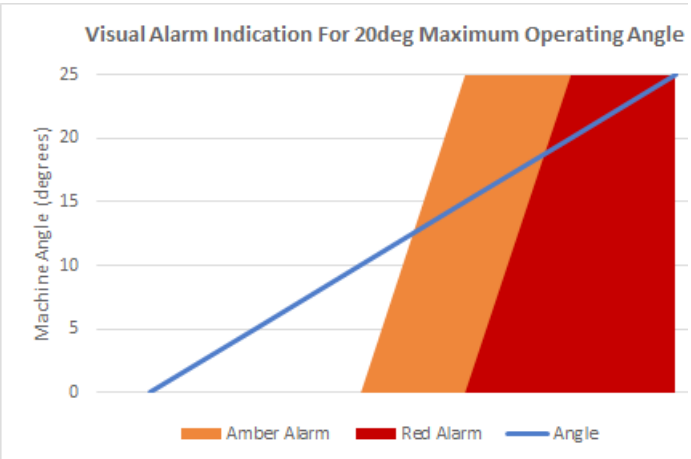
Finally, the device and all of its' connections are protected to IP66 for outside use in all weather conditions which also allows the Si-1 to remain mounted to the machine during power washing, cleaning and maintenance operations.

Annual safety and calibration testing provides traceability

The Emolice Si-1 is available now, contact your local groundcare specialist or alternatively contact Emolice at www.emolice.com for further details.

AV Alarms:

With the maximum angle configured to 20 degrees, the amber alarm is triggered at 15 degrees and the red alarm and buzzer is triggered at 20 degrees.



10 min installation

4 Step Simple Installation

1 Backplate Mounting

• Mount the backplate using 4x M4 bolts to the console or a suitable mounting bracket prior to attaching the Si-1.

2 Connecting Power

• Connect the power cable via a 2x Pin plug.

• Route and connect the red conductor to an ignition switched 10-30 VDC supply.

• Route and connect the black conductor to either the chassis ground or battery -ve terminal as appropriate.

3 Si-1 Mounting

• **Align the Si-1 with the backplate.**

• **Using the hex key supplied, bolt the Si-1 to the backplate.**

4 Configure

• **Power up the Si-1 and follow the on-screen menus to configure the device.**

Every issue we look at a range of motion products. This issue we look at PLC HMIs

PLC & H

Vision™ series

An award-winning series of programmable controllers (PLC + HMI) , ranging from palm-sized controllers with onboard I/O to large-screen controllers with snap-in I/O. Vision is a true workhorse: reliable, versatile, field-hardened – a cost-effective All-in-One controller.

Price Range ★★★★★

UniStream® series

Powerful programmable logic controller with incredible HMI features and a built-in webserver. A completely modular and scalable hardware – backed by the most efficient programming software you have ever used. Execute high-end projects – on time and within budget.

Price Range ★★★★★

I/O Expansion Modules

Complete lines of local & remote I/O modules and COM modules are available for the Vision, Samba and M90/91 series.

Additionally the I/O & COM Modules for Unistream® (known as Uni-I/O and Uni-COM modules) can snap to the back of UniStream and provide local or remote I/O Expansion.

Price Range ★★★★★

Jazz® and M91™

Jazz® is an All-in-One PLC controller that is as affordable as a "smart relay" — full-function PLC combined with a textual HMI and keyboard, with up to 40 onboard I/Os.

M91™ is an affordable All-in-One programmable controllers: a smart PLC with a textual HMI and keyboard, plus onboard I/O configurations; expands up to 150 I/Os.

Price Range ★★★★★

M.I

Put an end to hidden costs - Unitronics provide their software and all updates free of charge !

Samba™ series

A perfect fit for any small machine or simple project that requires a true PLC controller and a high resolution HMI colour touchscreen. Samba™ programmable controllers offer a range of on-board I/O configurations. Offering a flat fascia, compliant with IP66/IP65/NEMA4X

Price Range ★★★★★

UniLogic® for UniStream®

UniLogic® Studio is All-in-One software for hardware and communication configuration, Ladder and HMI applications which sees typical users slash their development time by up to 50%.

The power of UniLogic is in its design. Built-in, context-sensitive editors enable the user to:

- Write Ladder or C functions,
- Create beautiful HMI screens and interactive web pages,
- Instantly translate screens from one language to another,
- Easily track data and display it live via trends and gauges or export it to Excel,
- Raise multi-level Alarms and send notification via SMS or email,
- Run Recipes, and implement a broad range of industrial communication protocols.

VisiLogic™ for Vision™ and Samba™

Easily build applications with Drag & Drop, All-in-One software enables you to:

- Develop your PLC and HMI applications in one environment
- Configure Hardware & Communications
- Establish modem and data communications
- Test and debug your programs
- Software Utilities Suite: remote access and data management tools
- Control your application remotely from anywhere at anytime

Unitronics Added Value

All Unitronics software & utilities, plus updates are provided at no extra charge.

Personalised Tech Support & Forum membership are also provided at no charge.

Emolice Added Value

As Unitronics' authorised UK distributor, Emolice can offer the full range of Unitronics PLCS & HMIs, plus we offer first line support for installation and programming.

www.emolice.com | +44 1344 266530 | sales@emolice.com

Measuring tilt or inclination underwater is challenging. IP68 devices are only required to remain waterproof for 1 day to comply. For applications where long term tilt measurement is required, only a fully engineered solution will work.

"The Underwater Inclinometer solution from Emolice has unrivalled provenance when it comes to waterproofing devices - it's used on the Thames Barrier !"

How do you choose an underwater meas
trap of assuming that an IP68 or even IP
the question - "if I put your inclinomete
it fails ? Can you provide test data / refe

Under Water Angle Measurement

Why a global Civil Engineering company turned to Emolice for underwater tilt measurement

In the world of civil engineering, a project to build an aeration system to breath life back into a stagnated river should be relatively simple. Consisting of a series of rectangular, box section gates mounted on the river bed at a 45 degree angle, the gates protrude from the top of the water and break the water flow sufficiently to introduce oxygen. When bad weather causes water levels to rise, the gates automatically lower to sit flat on the riverbed and allow water to flow uninterrupted, therefore minimising the risk of localised flooding. It was exactly this solution that a major civil engineering company had successfully designed, installed and commissioned for a major river in Asia.

At the 6 week anniversary of the installation, all of the key indicators were good. The water was showing good signs of recovery and two major storms had proven that the gates could be lowered quickly and easily to maximise water flow and minimise flood risk.

As the 8th week passed, another storm caused water levels to rise. It was smaller than the previous two, but still required the gates to be lowered to minimise the risk of flooding. Unfortunately this time the gates failed to lower. A critical component had failed; the inclinometers were no longer communicating the angle of the gates to the control system.

On further investigation, the inclinometers (which conformed to IP68 and were deemed to be fully waterproof), were found to have water inside which had caused the electronics to fail. Reviewing the IP68 specification showed that 24 hours is the maximum time required for a device to be immersed without water ingress in order for it to be sold as IP68 or waterproof. The difference between a waterproof IP68 device and a truly 'waterproof, install it an forget' device is significant.

To reinstate the tilt measurement of the gates and ensure that the possibility of future failure was minimised, the consulting engineer turned to Emolice. With a proven track record of providing robust, bespoke engineered solutions for customer applications, Emolice worked with the consulting engineer to design and deliver a waterproof inclinometer solution for permanent underwater use. The final underwater inclinometer from Emolice was based on a waterproofing design which already had unrivalled provenance - it has been in continuous service on the Thames water barrier for many years ! Looking for an underwater position measurement solution ? Contact us today at sales@emolice.com

Modern Steel

"Breadth of products, engineering & integration expertise plus on time delivery were critical requirements"

The UK steel industry produces 11 million tonnes of steel a year. Whilst some steel processing plants continue to face an uncertain future, others that specialise in high-quality, high-value steel products continue to grow and invest in their infrastructure.

One such UK based producer is modernising their automation processes. A key part of the process that required updating was access to the vacuum degasser for scheduled maintenance and repair.

A vacuum tank degasser is used as part of a batch process to reduce the concentrations of unwanted dissolved gases in the liquid steel. Vacuum degassing takes place after the ladle (which is full of moulten steel) has left the furnace and before the moulten steel is poured into the ingots or introduced into the continuous casting process.

The vacuum degasser can be moved vertically on hydraulic lifters using a visual system to determine its' position. Wrap around gated pedestrian gantries allow access for maintenance and repair at regular intervals along the degassers' vertical travel. Interlocks on the gates prevent access when the degasser is not at the same level as the gantry floor, however the low resolution of the visual positioning system plus regular false readings caused by dust buildup means that the floor level cannot be guaranteed, causing a serious potential hazard. Mechanical switches were found to be unsuitable for determining the degasser position as lateral movement (during raising and lowering) exceeded the working tolerances of the switches.

During modernisation, Emolice were tasked with proposing an alternative solution to the visual positioning system to control hydraulic position.

Emolice proposed a solution using draw wire absolute linear encoders from POSITAL. The draw wire encoders were insensitive to the lateral movement of the degasser whilst it is raised and lowered. To provide redundancy, two encoders were specified with different interfaces (SSI and Profinet) and the outputs of the two encoders were continuously compared by the PLC.

The final redundant solution ensures that the gantry floor level is within +/- 1.5mm, a ten fold improvement in accuracy.

Bespoke Machines

How our everyday consumer technology is changing machine owner / operator expectations

IDEAL FOR

- Weighing, Mixing, Cutting & Processing Machines
- Reducing control panel build time by 63%*
- Fast changes during machine prototype and trials
- Simple, cost effective customisation for bespoke applications
- Perfect for machine builders where no two machines are the same.

We live in a world where consumer technology is developing apace and increasingly shapes expectations of how we interact with and control workplace technology. Our user experience expectations now demand slick, beautifully designed touch screens with intuitive, easy to use interfaces that replace old fashioned discrete lights, buttons and counters.

In response, more and more machine builders are turning away from traditional hard wired control panels and embracing simple yet powerful touch screen PLCs with integrated HMIs. These PLCs provide the in-demand consumer experience by replacing the function of individual controls such as switches, buttons and gauges with a single integrated touch screen, and in doing so, significantly reduce the time and cost of producing a control panel for the machine.

"The competitive advantages and cost savings are compelling"

For machine builders that produce bespoke machines to customer requirements, the simplicity of making updates to PLCs facilitates fast changes during machine prototype and trials. Furthermore, by standardising on the PLC hardware across all machines and then simply changing the configuration for each variant, bespoke machine builders can lower costs by benefiting from purchasing economies of scale that are unachievable with traditional hard wired control panels.

As a company who have long been at the forefront of PLC design for machine builders, Unitronics products are designed to deliver the in-demand consumer experience whilst lowering machine builders costs. Incorporating full colour touch screens from 3.5" up to 15", Unitronics PLCs offer everything from simple configuration and control, to advanced features such as remote SMS & email access.

UNITRONICS

PLC & HMI in one. Slick, beautifully designed touch screens

What is a PLC and HMI ?

Simple control panel alternatives.

01 What's a PLC ?

Basically an industrial computer, a Programmable Logic Controller (PLC) replaces the control panel, switches, buttons and relays.

02 What's an HMI ?

An HMI (or Human Machine Interface) is the graphical touchscreen software used by the operator to control the PLC

Cost Cutting

We look at the problems faced by a major hydraulic hose assembler, and the ways the Emolice team helped to solve them

AVAILABLE FROM
Emolice Distribution UK
visit www.emolice.com

STARTING PRICE
• Bespoke solution from Emolice, POA for similar

£ SAVINGS

The financial case for implementing a closed loop system in this application was compelling. The combined costs of producing a batch of 350 hoses per shift was not limited just to the scrap material and lost labour.

Forming part of a JIT (just in time) manufacturing service to their customer meant loss of downstream productivity for them too.

Hydraulic hose assembly is fundamentally simple. The first stage is to cut the hose to the length determined by the works order. Taken straight from a reel, the hose is then fed manually through an aperture below the saw until it reaches a backstop. The backstop determines the hose length and is manually set by the operator according to the length of hose required. Once the backstop is reached the saw cuts the hose and the process is repeated...up to 350 times per shift.

The process works flawlessly, but is subject to the most common manufacturing flaw; human error.

If the backstop is set incorrectly then the entire batch is scrapped. However, the downstream complications of delaying some of the most demanding manufacturers' production processes can be greater.

To remove the possibility of incorrectly sized hoses, Emolice were invited to review the assembly process and make recommendations. The solution - a closed loop linear measurement system integrated with the works order system.

THE SOLUTION

MAGNETIC LINEAR SENSING SYSTEMS
The solution used the Elgo IZ16E-600 wireless linear measuring system.

A magnetic tape was mounted along the length of the saw with an incremental sensor head moving along the tape to wirelessly send the exact position of the backstop to the Elgo IZ16E-600.

The operator is able to see the backstop position from their workstation and visually compare with the required length on the works order.

Additionally, bespoke software written and delivered by Emolice compares the actual position of the backstop with the required length of the hose from the works order. If the two values match then a relay energises the saw allowing the cut to be made. If they don't match then the cut is prevented.

LATEST TECH:
Take a look at the Elgo range: https://goo.gl/Gdfvpt

LAUNCH CALENDAR Autumn

JUNE 7TH

EMOLICE Technology

EMOLICE technology, the design and manufacturing subsidiary of EMOLICE have released their Autumn / Winter 2017 product launch schedule

MORE INFORMATION:
https://goo.gl/uHRR9S

JUNE 12TH

YOUTUBE !

Our new Youtube channel continues to grow, featuring tutorials, product demonstrations and more !

MORE INFORMATION:
https://goo.gl/TnBE49

JUNE 19TH

ELGO ANNOUNCE LIMAX33 CP

EMOLICE have announced the availability of the LIMAX33 CP lift control & safety product.

MORE INFORMATION:
https://goo.gl/1guRpf

JUNE 19TH

Explosion Proof Encoders, Zone 2 & 22

POSITAL have expanded their range of explosion proof rotary encoders with new ATEX products dedicated to Zones 2 & 22 for use in atmospheres where there are potentially dangerous levels of explosive gases or dust (3G and 3D).

MORE INFORMATION:
https://goo.gl/7kxsjz

JULY 7TH

THE SOCIALS

Follow us ! All of our latest information is shared live via our social media channels:

MORE INFORMATION:
Twitter: @emolice
Linkedin: emolice-distribution

featured launch

JULY 30TH

EMOLICE LAUNCH SI-1

EMOLICE are pleased to announce the launch of their Si-1 slope indicator. Designed & manufactured by Emolice in the UK, the Si-1 Slope Indicator leads the way in reducing accidents caused by operators exceeding maximum tilt angles of machinery.

MORE INFORMATION: **https://goo.gl/uHRR9S**

August 16TH

LIMAX LIFT INFORMATION & CONTROL

The LIMAX range of lift information & control systems is now available in the UK & I exclusively from EMOLICE.

MORE INFORMATION:
https://goo.gl/o3XY9v

August 26TH

POSITAL FRABA 2017 CATALOGUE

POSITAL have launched their 2017 catalogue of rotary and linear encoders and accessories.

MORE INFORMATION:
https://goo.gl/2he4a1

The "IP" environment rating is familiar to nearly all sensor, encoder and instrumentation specifications, but what does it mean ?

AND FINALLY...

IP ratings are often quoted on the specification of sensors and instrumentation. The IP rating consists of the letters IP and a two digit number. IP stands for "Ingress Protection" and the number indicates the degree of protection that has been provided to the item of equipment.

The reason why IP Ratings exist is basically twofold. First and foremost is the safety of persons using or coming into contact with the equipment. The most obvious example here is protection against the ingress of water. Everyone knows that water and high voltage electricity are a very dangerous combination so any electrical equipment used in a wet environment needs to be well sealed to keep its electrical parts dry.

The second issue is the life expectancy of the equipment itself. Using the same example, it won't work for long if water can get into it. Of course water is not the only thing that needs to be kept out of electrical devices. Casings or enclosures need to be sealed against intrusion by tools and fingers as well as keeping out dust and foreign bodies of all kinds.

IP ratings are internationally recognized and are defined by International Standard EN60529 (British BS EN60529:1992, European IEC 60509:1989), so the numbers that follow the letters IP, mean the same everywhere.

"A common example: IP67 is protected against dust and water up to 1M"

1st Digit	Protection Against Solid Objects
0	Not protected
1	Protected against solid objects > 50mm (e.g. hands)
2	Protected against solid objects >12mm (e.g. fingers)
3	Protected against solid objects >2.5mm (e.g. tools)
4	Protected against solid objects >1mm (e.g. wires)
5	Protected against dust (that can interfere with the operation the equipment)
6	Total protection against dust
X	Indicates that protection against solid objects is not defined

2nd Digit	Protection Against Liquids
0	Not protected
1	Protected against dripping water >50mm (drip proof)
2	Protected against dripping water when titled up to 15°
3	Protected against spraying water (rain proof)
4	Protected against splashing water (splash proof)
5	Protected against water jets in any direction (jet proof)
6	Protected against heavy seas
7	Protected against the effects of immersion between 15cm and 1m
8	Protected against long periods of immersion under pressure

Swipe. Pinch. Zoom & more

UniStream 10.4" - The PLC with the Multi-touch Screen!

UNITRONICS® www.emolice.com | +44 1344 266530 | sales@emolice.com