Improving energy efficiency

Global warming and the drive to minimise greenhouse gas emissions has put the focus on how to make the most of natural energy sources. Solar tracking is an obvious way to improve the efficiency of solar power plants. As the sun moves across the sky, an electric actuator system makes sure that the solar panels follow automatically and maintain the optimum angle to make the most of the sunbeams.

In recent years, the TECHLINE® team of engineers and consultants have given solar tracking their special attention. The well-proven reliability and long maintenance-free lifetime of LINAK actuators even under extremely rough conditions make TECHLINE electric actuator solutions particularly well suited for this kind of application.

Flexibility is a keyword. You get excellent stepless positioning and feedback to your control system - both digital and analogue. When the main power is not available, LINAK actuators can run on battery backup and manual override is also available.

Creating value for our customers – by cooperating with LINAK® you get:
• Dedicated worldwide sales and service teams in more than 30 countries.
• Quality actuator solutions developed to meet the harsh environments to which solar parks are exposed.
• Complete and simple solutions from one supplier. As an option our actuators come with embedded Modbus technology for ease of communication and less component complexity.

LINAK® industrial actuators offer a versatile array of movement solutions for solar tracking, with the overall goal of improving the yield from PV installations.

LINAK offers service worldwide

Please contact your local LINAK office with your enquiry
Actuators with embedded Modbus communication

Modbus is part of our IC™ programme and is a well-known communication technology that has been on the market for years. Modbus simplifies the communication, meaning you can connect several solar trackers in serial and thereby eliminate the need for lots of signal cables and still control the whole park from a central point.

Besides from improving your return on investment, Modbus has many other advantages:

**Lower investment**
- Less complex system
- Less cables due to BUS topology
- Less need for I/O boxes
- Less programming time due to standard communication language
- Less installation time as the number of components are reduced and the control of the solution is embedded
- Everything programmable and controllable from a central controller
- One scalable solution for different sizes of installations

**Longer lifetime**
- Electronic overload protection protects the actuator. The current can be adjusted in both directions.
- Lowering of speed and soft-start and stop reduce the wear on mechanical parts
- Temperature surveillance and alarm
Imagine...
...if LINAK could reduce your maintenance costs by 50%?

Lower maintenance and operational costs
- Less components
- Maintenance-free mechanics
- Easy integration with SCADA systems through BUS interface
- Integrated diagnostics enable preventive maintenance.
  E.g. log of current, cycles and temperature
- Remote monitoring of installation by use of an Ethernet-BUS gateway

Improved yield of PV installations
- Accurate positioning of solar panels or mirrors improve return of investment
- Enhancement of solar algorithm from a central point

What is Modbus
Modbus Protocol is a messaging structure developed by Modicon in 1979. It is used to establish master-slave communication between intelligent devices. It is a de facto standard, truly open and the most widely used network protocol in the industrial manufacturing environment. It has been implemented in different devices to provide reliable data transport between devices.
IC movement for solar tracking

IC - Integrated Controller™ is the range of integrated control options for TECHLINE® actuators that present you with almost unlimited possibilities for superior control and monitoring, to enhance the value and performance of your application.

For solar tracking, actuators with IC provide cost-effective performance and innovative technology:

- Simple installation with built-in electronics
- Easy overview and precise control of the actuator movement
- The actuator can be customised on site to fit multiple solutions in a single application
- Easy monitoring of the actuator’s condition which ensures a minimum of downtime
- All IC options are based on the same welltested interface, which is covered by the actuator’s IP degree

For more information on IC, please go to LINAK.COM/SEGMENTS/TECHLINE/TECH-TRENDS/INTEGRATED-CONTROL/
Move for the future

Step into the future world of movement and enhance your competitive edge. Do you want cost-effective performance, innovative technology and a competitive edge?

Go for IC™ and Move for the Future™
LINAK® industrial actuators offer a versatile array of movement solutions for solar tracking.

With **thrusts up to 15,000 N, max speeds up to 160 mm/s, and strokes between 20 and 999 mm**, the actuators are highly adaptable for a wide variety of applications.

Industrial actuators with **heavy-duty aluminium housings** are very suitable for use in corrosive environments. Having been thoroughly salt spray and chemical resistance tested and approved for ratings up to **IP66 and IP69K static**, these actuators will work reliably for years, even when exposed to salt, water, wind, and sun.

**Operating temperatures between -40°C to +85°C** make them fit for work in numerous settings.

By using an integrated controller, industrial actuators are **configurable** and offer **relative or absolute position feedback** as well as **performance monitoring**.

* Product is shown with optional trunnion mounting
The LINAK solar park

At LINAK, we want to showcase our flexible actuator solutions in action. Therefore, we have developed a solar tracking solution based on our LA35 and LA36 actuators for our solar park at LINAK headquarters in Guderup.

The park has been successfully up and running since 2011 and in 2014 we added an additional 5,000 square meters of photovoltaic (PV) panels on the roof of our new factory.

By tracking the movement of the sun, we are able to get 30 - 40 % extra output from the panels. There are three different trackers, all single axis and all using Modbus communication.

Thanks to the integrated Modbus, we were able to daisy chain the actuators - making the cabling and overall installation easier. Furthermore, the Modbus communication allows us to remotely monitor the status of each solar panel and ensure that they are automated based on seasons and weather conditions.

At this point, the entire PV facility covers approx. 12 % of our total power consumption.
100% function tests

In each application, the actuator is just one component of many, but at TECHLINE® we fully appreciate that it is of utmost importance to you and your customers. Not a single actuator leaves LINAK® until it has undergone a 100% function test.

Depending on the actuator type, various tests have been carried through. Please consult your local LINAK office or take a look at the actuator data sheet in question to get a thorough test overview.

This is your guarantee that a solution based on LINAK TECHLINE electric actuator systems is a solution that will work reliably for years and years.

Electrical tests:
All electrical parts are tested i.e. power supply, power and signals cables, control signals etc. Electrical immunity is tested according to industrial standards i.e. for radio noise, electrical discharge and burst.*

EN/IEC 61000-6-4 - Generic standard emission industry
EN/IEC 60204 - Electrical equipment of machinery
EN 50121-3-2 - Railway applications - Rolling stock apparatus
94/25/EC - Recreational crafts directive
EN/ISO 13766 - Earth moving machinery
EN/IEC 61000-6-2 - Generic standard immunity industry
2004/104/EC - Automotive Directive
EN/ISO 14982 - Agricultural and forestry machines
EN/ISO 13309 - Construction machinery

* These tests do not apply to third party products!
**Climatic tests:**
In the climatic test the actuators are tested to operate in extreme temperatures as well as to endure rapid changes in temperature. In some tests, the actuator has to withstand going from a +100°C environment to -30°C repeatedly and still maintain full functionality.

**Mechanical tests:**
**Vibration:** The actuator must withstand continuous vibration in three directions.
**Shock:** The shock test puts the actuator through 3 shocks of up to 100 G in each of 6 directions.
**Bump:** The actuator receives bumps of up to 40 G in each of six directions several hundred times.

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**EN600068-2-1 (Ab)** - Cold test
**EN600068-2-2 (Bb)** - Dry heat:
**EN600068-2-14** - Change of temperature
**EN600068-2-30** - Damp heat
**EN600068-2-52** - Salt spray
**EN60529-IP66** - Degrees of protection
**BS7691/96 hours** - Chemicals

**EN600068-2-36 (Fdb)** - Vibration
**EN600068-2-29 (Eb)** - Bump
**EN600068-2-27 (Ea)** - Shock
LINAK has a world-class sales and service organisation. Today we are present in 35 countries all over the world. For further information, please visit our website: LINAK.COM

For further information, please visit our website: linak.com/business-areas/energy/solar-tracking/

TERMS OF USE
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