

**A newsletter from
JVL Industri Elektronik A/S**

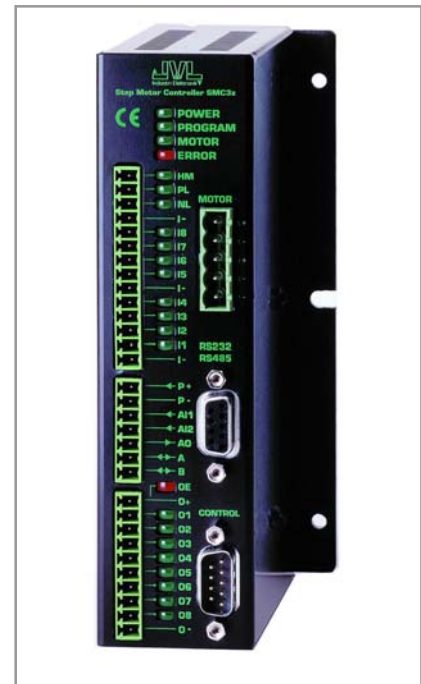
New Intelligent Step Motor Controller from JVL

Step Motor Controller SMC35 offers new features for programming and control

The SMC35 is JVL's new Step Motor Controller, with a built-in m-PLC, 11 inputs and 8 outputs. The Controller offers high torque, high velocity and high resolution in order to solve the most demanding applications in the industry. Programming is accomplished from a PC using JVL's Windows-based software *MotoWare*, which ensures quick and easy set-up, programming, and running in of a system. 2 built-in microprocessors ensure true multi-tasking with change of velocity, acceleration, outputs, etc., while the motor is running. The Controller additionally includes advanced timers, counters and interrupt facilities so that any task can be solved. An encoder input enables motor position and "stall" to be detected so that corrective

measures can be taken.

The SMC35 offers fast, 20kHz switching, recirculating digital current control, anti-resonance circuitry and software selection of current, step resolution, velocity, etc. It is protected against short-circuiting motor phases and outputs. It offers selection of mini-step resolution, where each mechanical full-step is divided into many fine small steps (1, 2, 4 and 8 ministeps/fullstep). This gives better motor operation at low speeds, lower noise, resonance-free operation and finer resolution. Using a fieldbus interface, it is possible to connect peripheral equipment such as a keyboard/display, extra I/O modules, etc.



JVL Develops Mini Driver for Motor Mounting

Specially designed Step Motor Driver can be directly mounted on the motor

As a customised solution for one of our customers, JVL has developed the smallest step motor driver to date. The Driver measures only 52.4 x 52.4 mm and can be directly mounted on the motor. It fits onto most types of high-torque motor, and can of course also be mounted on a surface.

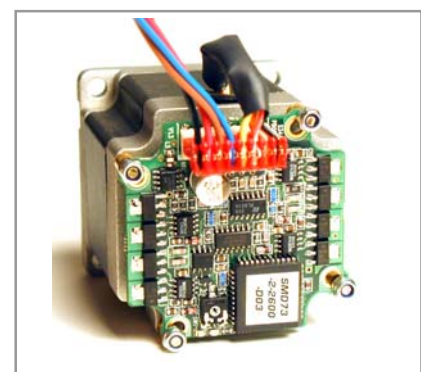
The PCB is equipped with an 8-pin connector. 4 terminals are used for the motor connection, 2 for the external power supply, and 2 are used to control the motor via step-pulse and direction signals. The Driver supplies 2.6A RMS in each phase, and current is automatically regulated to 0.8A when the motor

is not receiving step pulses. The Driver controls the motor in half-step mode, which results in 400 steps/rev. The Driver can handle up to 20 ksteps/sec and a "half-step" current regulation ensures that the current is increased by a factor of 1.4 every second step in order to yield maximum motor torque. The Driver can be powered from 15-28VDC up to 5A. It is equipped with a green LED which indicates that power is on, and a red LED which indicates an error condition.

For other applications, the Driver is available with step resolutions of 1/1, 1/4, 1/8 steps/rev., and with selectable

motor current.

It has been our pleasure to help our customer with this unique design, which will now be produced in large numbers.



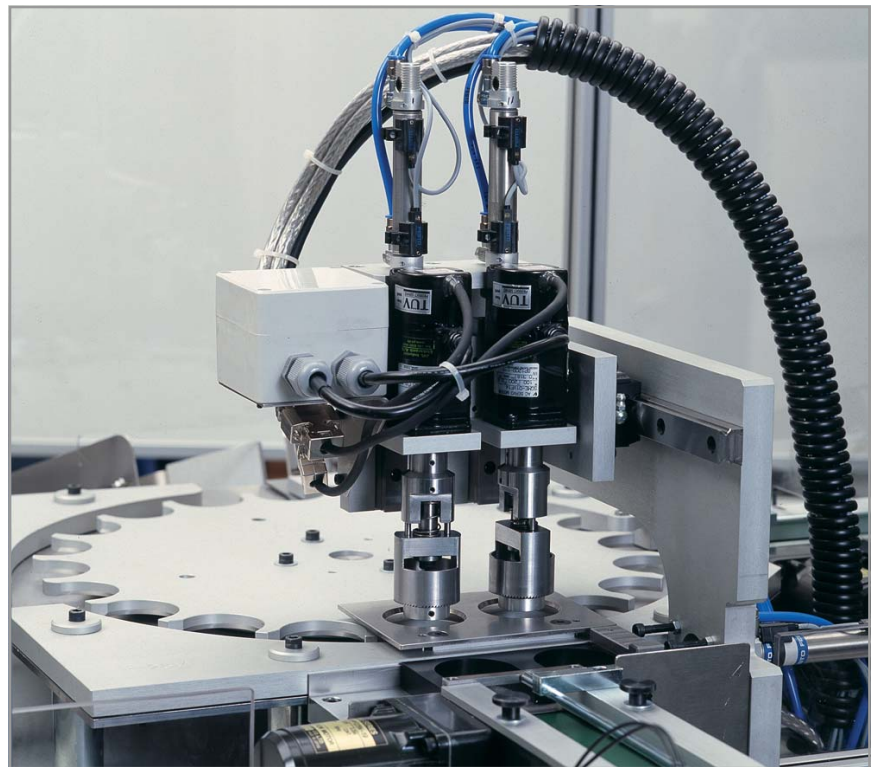
Automated Turntable uses JVL Controllers

Plastic components assembled using a robot from the company *G&E Maskinteknik* in Farum

The company *G&E Maskinteknik* in Farum north of Copenhagen has recently completed construction of an automated assembly robot that screws 2 plastic components together to produce final units.

The machine is based on a large turntable that is driven by a step motor and into which the base of one of the two plastic components is fed. At 90 degrees to the turntable axis, the second component is fed by a sled equipped with 2 servo motors that pick up 2 components, feed them to the turntable, and using torque control, screw the components together with those in the turntable. Vertical and horizontal control of the sled with the servo motors is achieved pneumatically. The machine is additionally equipped with a detector that automatically rejects defect components, and it includes a counter so that the required number of completed units can be packaged.

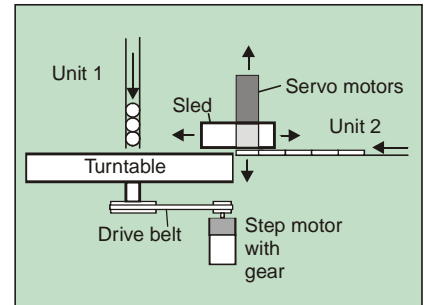
The step motor, which drives the turntable via a drive belt, is equipped with a planetary gear from *Technoingranaggi Riduttori* and is controlled by a JVL Step Motor Controller SMC26B. The overall control of the assembly machine is taken care of by a PLC.



Part of the assembly machine, showing the turntable and the 2 servo motors.



Turntable driven by step motor and gear.



Principle of the assembly machine.

JVL as a Project Partner

Contact us about your motion control applications

Today, more and more companies are choosing JVL to work with them on solving their motion control applications. These companies are finding that a partnership with JVL means time savings and thus significantly reduced costs. JVL has extensive experience and expertise in positioning equipment, system design, commissioning and mechanical solutions.

We can therefore help customers from the conceptual phase to system design and putting the final solution into production. In this way we ensure our

customers receive an optimum solution, without any unforeseen problems.

And since JVL's product range is very wide, we can also provide solutions for all of the mechanical aspects of positioning and motion control. We can supply gears, clutches, and linear motors with built-in spindles or drive belts. We have both 1-axis and multi-axis controllers, as well as PC-based controllers.

As described in the previous issue of JVL News, we have now also made our

debut on the fieldbus network, enabling JVL equipment to communicate directly with all PLCs equipped with a fieldbus adaptor.

We develop our step/servo motor drivers and controllers ourselves and can therefore also supply completely customised solutions when larger quantities are required.

Contact us for further information about solving your motion control needs.

Multi-function Step Motor Driver

Compact step motor driver can replace Parker Compumotor driver

For years, many of our customers throughout Europe have used a driver manufactured by Parker Compumotor, type SD12/13/14/15/15M, and have noted several points about these drivers that they would like to see improved. Since Parker have not further developed the series, JVL developed a driver that is compatible with the Parker driver, both functionally and in terms of connectors. The JVL Driver PA0076 does however offer improvements in many areas:

- 1: High-efficiency MOS FET technology ensures less heat generation.
- 2: Single power supply of 15-80VAC/DC ensures fewer cables and avoids double supply.
- 3: Built-in potentiometers so that velocity and acceleration can be adjusted on the PCB. This gives lower cost price in external installations and fewer errors.
- 4: Increased options for mini-step operation - up to 4000 steps/rev.
- 5: DIP switch change of modes ensures simpler set-up and fewer errors.
- 6: LED indication for power and error.
- 7: Lower price through the use of latest technology, e.g. without the



use of heat sinks and other expensive components.

JVL has used the PA0076 Driver as a direct replacement for the Parker SD10 series in many projects, and in all cases the JVL Driver has proven to be a more than satisfactory solution for our customers.

Auto-tuning in the New AC Servo Controller

Revolutionary "recipe-based" auto-tuning in AC Servo Controllers AMC20/21/22

JVL has invented and developed a completely new method for tuning motors. PID parameter tuning can now be a thing of the past. JVL's revolutionary "Auto-tuning" guides the user through a few questions and then performs an intelligent tuning of the loaded motor.

JVL's Auto-tuning surpasses all other servo controllers on the market as it offers a new and more reliable way to perform motor tuning. With JVL's auto-tuning you need never adjust PID parameters again. The JVL AMC20 series of Servo Controllers perform auto-tuning using a 6th-order filter, as opposed to normal 1st-order (PID) or 2nd-order filters.

An auto-tuning algorithm, such as that used in the Motor Controllers, must be able to precisely define a system in order to design a regulator that produces the required performance. But many manufacturers' auto-tuning algorithms only function up to certain limits. They often fail when it comes to undamped or complex systems. The new, programmable auto-tuning algorithm in JVL's AC Servo Controller AMC20/21/22 enables even very complex systems to be tuned correctly. In cases where other tuning methods give up, JVL's "recipe" technology can modify the AMC20's auto-tuning algorithm to adapt to the exact system being used.

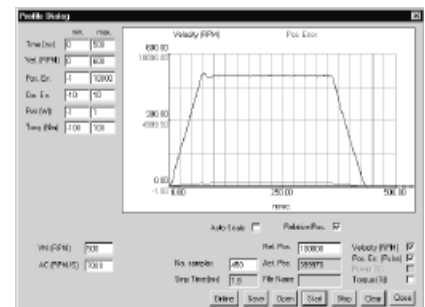
The user is guided by a wizard, which consists of an expert system that poses several questions about the system to be tuned. Once this is done, the wizard selects the "recipe" that matches the system in question, and identification and tuning is then performed automatically.

The new filter and recipe-based auto-tuning in the Controllers offers:

- Shorter run-in and commissioning of machines and systems.
- Faster settle times.
- Unskilled users can tune the motor
- Short run times
- Oscillations caused by non-linear mechanics are avoided, due to the high-order filter.
- Minimal positioning error during operation and stand-by.



A screen display gives a super user information about the mathematical model of the system so that he can perform adjustments.



Finally, the system performance can be displayed graphically as a velocity profile.

JVL's auto-tuning system is unique and will be able to solve many servo system tuning problems both quickly and simply.

JVL Celebrates 10th Anniversary

Reception held on the 1st December 2000

On the 1st of December last year, we celebrated the 10th anniversary of the foundation of JVL as a registered company. Back then in 1990, there was only 1 employee in addition to the company's two founders and owners, engineers Bo Valeur Jessen and Mads Vernon Jørgensen.

The origins of the company go even further back however, and 5 years previously the first step motor controllers were developed.

Today, a decade after company registration, we have 18 employees and can look back on 10 busy and very satisfying years of continuous growth in turnover and activities. We are headquartered in our own modern, well-equipped premises and have a very broad range of products that covers

everything required for modern motion control applications. Our product range includes our own Step, AC Servo, and DC Servo Motor Controllers (and more) as well as a wide selection of other manufacturers' equipment for which JVL acts as a representative. These products include multi-axis controllers, motors, gears, encoders, etc. Throughout the years we have concentrated intensively on developing and manufacturing our own range of controllers, and JVL's growth shows that we have understood our customers' needs correctly. At the same time, we have concentrated efforts in export markets and have achieved significant success in several countries. An important aspect of our activities has always been the ability to advise

customers from the start of a project until the completed system is put into production. We have thus also developed a lot of specialised software. In addition, we provide customised solutions and products for specific needs and this accounts for a significant part of turnover.

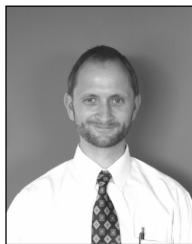
First and foremost however we would like to thank our customers, who have contributed to JVL's success.



New Employees



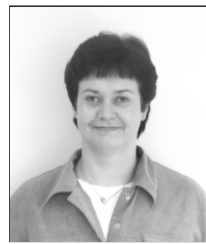
Lars Jeppesen



Palle Sørensen



Ulla Voigt Nielsen



Pia Kofoed Christensen



Thomas Bergen

It is again our pleasure to welcome several new employees to JVL. *Lars Jeppesen* has joined our development department. He holds a B.Sc. in engineering from the Technical University of Denmark, specialising in embedded systems. Lars also has extensive experience with C++ programming and will work on the development of customised systems & test equipment, both hardware and software.

Palle Sørensen also holds a B.Sc. in engineering and has 8 years of experience in our field. At JVL, his work will involve sales on the domestic market in Denmark, including project sales and training. We are confident

that our Danish customers will benefit from Palle's know-how and experience. *Ulla Voigt Nielsen* has been employed in our accounts dept., where she will primarily take care of debit and credit accounts. Ulla comes to JVL with many years of experience in this area in the electronics industry.

Pia Kofoed Christensen joins us as an assistant at reception and will also take care of statistics and assist with purchasing and stocks. Finally, *Thomas Bergen* joins JVL in internal sales. He holds an M.Sc. in electronics from the Technical University of Denmark and has extensive experience of motors from previous jobs. Thomas is a welcome addition at JVL to

ensure our continued rapid and competent customer service.



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