New WLAN module for JVL's MAC motors

Wireless connection to Ethernet
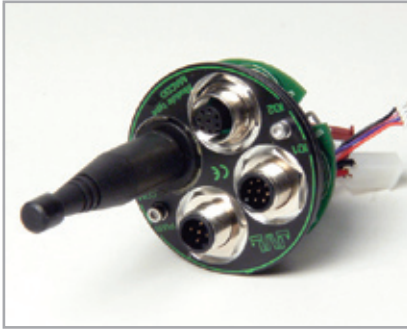
A wide range of integrated AC servo motors makes JVL one of the leading suppliers in the field of motion control. The numerous features of these motors include a unique modular concept that makes it extremely easy to adapt the motors to a large number of applications. Plug-in expansion modules are used to adapt a motor to the application. In this way, customers have flexibility not provided by any other motors on the market and only pay for

the features required. In addition, JVL can supply special customised modules to meet customer requirements.

With the introduction of a newly developed WLAN Module, JVL can now offer the facility to connect integrated MAC motors to a company's existing Ethernet, thus providing access to set up and control the motor from anywhere on the network. Moreover, with appropriate IT-infrastructure, it is

possible to access the motors via the internet using fixed IP-addresses or via VPN.

The new WLAN Module provides completely new opportunities for remote control, monitoring and diagnosis, thus making the motors more suited for remote location where service would otherwise require long transport times.

Bus systems

Whereas PLCs have previously used axis modules with either +/- 10V control and encoder signals or pulse and direction signals, bus systems in both step and servo motor systems have become more and more widespread. Today JVL can supply bus modules for RS232, RS485, CANopen, DeviceNet, ProfiBus, Bluetooth and WLAN.

In the past, step or servo axis modules in PLCs were often single axis modules. This made systems expensive due to the number of additional modules and cabling required for each individual axis. Fault-finding and maintenance

were also more costly in the long term because of the large number of potential faults.

Using bus systems, it is often sufficient to have a single card in the PLC for communication and a 2-core bus connection from motor to motor. Fault-finding and maintenance have thus also become significantly simpler and cheaper.

JVL decided approximately 10 years ago to make it easier for the customer in this respect, but also to support older systems with axis modules. Our

starting point was a motor with built-in electronics, with a connector for powering, a connector for bus communication, and possibly local IOs for end-of-travel and reference sensors.

Today there are many types of bus system for industrial use and new types continue to appear to meet the needs of specific application areas. Using JVL's concept, it is easy for the customer to use the same motor and method of programming, and equip the motor with a module for the bus system required.

Updated JVL nano-PLC module

JVL's nano-PLC module, which is compatible with all JVL MAC motors, has now been updated to provide extended functionality. The new features include a "Calculator" with +, -, *, and / operators via which all motor registers and variables can be included in calculations.

Another new item is an even more advanced feature: branching – a conditional jump via which the program jumps to a specific code-line depending on the result of a comparison of 2 registers.
The user-interface is still the familiar point-and-click method of program-

ming. In all, a total of 16 different command types are now available as well as Remarks and Binary Commands. Binary Commands make it possible to use entirely new functions that are not yet generally available, Contact JVL if you require a function that cannot be performed using the 16 standard command types.

The nano-PLC module is available in 3 hardware models: with SubD connector (MAC00-R1), with cable glands (MAC00-R3), and with M12 connectors (MAC00-R4). All 3 modules have 8 Digital Inputs, 4 Digital Outputs and 1 Analogue Input.
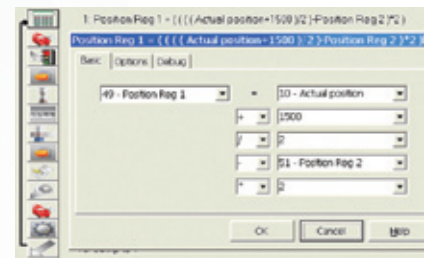

Example of the new calculator function
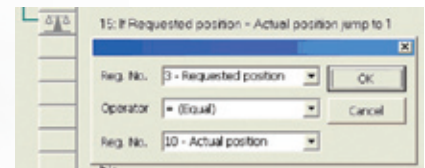
Example of the new Jump function

Stepper motor controller SMC75

JVL can now present a step motor controller with RS485 and CANbus serial interface. 8 IOs can be configured as inputs, outputs, or analogue input that can be controlled via a nanoPLC and MacTalk graphic programming. The very compact 57x57mm PCB contains everything required to solve a modern control task either as a stand-alone controller or controlled from a PLC or PC via serial commands or IO. MODBUS RTU and CANopen give the possibility for easy and fast connection to a PLC. For PC or IPC an ActiveX/OCX driver
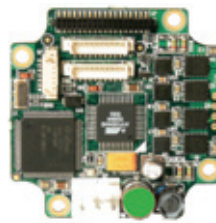
is available for simple interfacing to LABview, Excel, VB or other Windows programs. The SMC75 uses the same protocol as the MAC motors and can therefore be connected to the same RS485 bus system.

- NanoPLC with 8 IO at 24V
- RS485 up to 962 kbit
- CANopen DSP 402
- MODBUS RTU

- Resolution 1600 step/rev.
- Pulse/Direction mode
- Supply 12-48V DC
- Motor current 0-3Amp RMS
- Dual supply for safe emergency stop
- ActiveX/OCX driver available

The PCB can be built into a separate instrument or mounted directly on the back of the motor thus providing a cost-effective solution. Alternatively it can be delivered by JVL in a box with cables or M12 connectors, for mounting in a bottom plate or DIN rails.

MAC motors – special versions

The MAC050 to MAC141 range of JVL integrated servo motors can be customised to a wide range of customer requirements. Some of the special versions already supplied by JVL include:

- With round flange and special hexagonal shaft
- Motor housing machined to a spe-

cific required diameter
- IP67 shaft sealing
- Stainless steel flange and shaft
- Shorter housing and cable outlet on the side
- 6 or 8 mm shaft with or without key
- Shaft with hole for mounting on worm gears
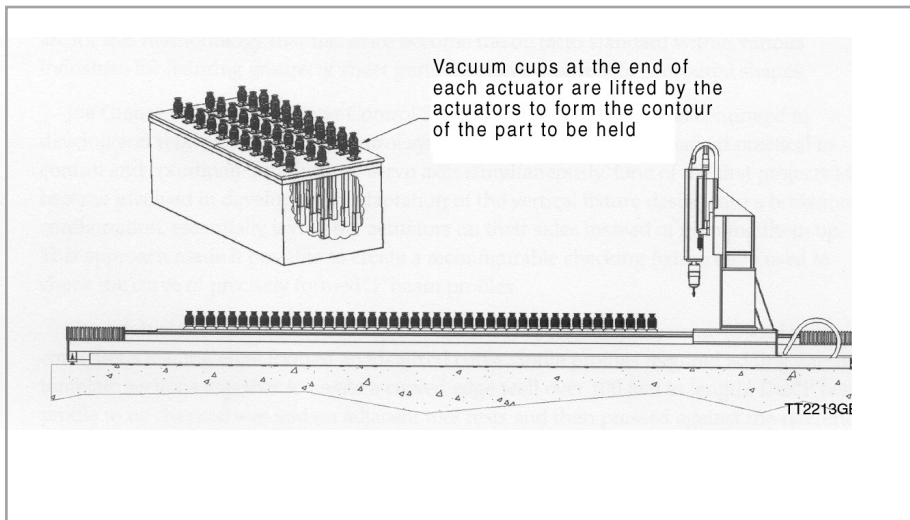- Without driver circuitry. Only with

Hall sensor and encoder mounted.
- Housing colour to specification
Some of these special versions are available from stock, e.g. motors for mounting on worm gears. Other versions may require special production and are subject to minimum order quantities of 10 to 100 units. Contact JVL for full details of the possibilities.

Tooling machines use MAC800

American company uses MAC800 motors to control a large number of actuators

Vacuum cups at the end of each actuator are lifted by the actuators to form the contour of the part to be held

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American company Motion Control Systems has specialised in the manufacture of very large tooling systems for large parts with curved surfaces. To provide a holding fixture that can hold the curved section during tooling, a large number of actuators, each fitted with a vacuum cup are used. Computer generated data-sets configure the holding fixture into the 3-dimensional curved form required. Typical customers for this type of system include the aviation industry.

These systems use specially developed actuators that have a large range of movement based on an internal ball screw. Great emphasis is put on the accuracy of movement, and since a large number of actuators are used in each system, there are high demands on operational reliability and on finding the most economic way of producing each actuator. MCS has been working with such systems since the beginning of the 1990s and has supplied a large number of systems totalling many thousands of actuators.

In the fourth quarter of 2006, Motion Control Systems delivered a further developed, state-of-the-art system. This system uses JVL's integrated MAC800 motors in each actuator, providing a set-up time of less than 4 seconds.

MCS developed the mechanical design of the system, integrated the hardware, designed the electrical system and the motion control network.
In this way MCS achieved a very robust system at relatively little cost, controlled by software with very advanced technical features. MCS has emphasised the advantage of simplification by having all the electronics integrated into each actuator.

The actuators can be extended to a length of up to 1.22 m (48 in) and MCS's standard software supports up to 500 units. Accuracy of movement is 0.05 mm (0.002 in) and load capacity is up to 250 kg (550 lbs).

Motion Control Systems
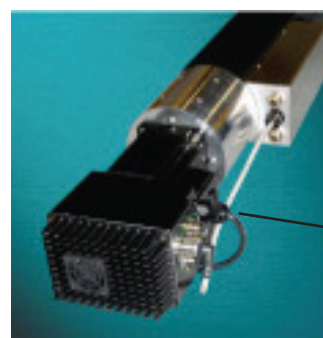
New WLAN module ...*continued from front page*

For short distances and local use too, the WLAN module means that cabling can be avoided. Software can be used to connect a PC to the motor as if it were connected via a serial RS-232 cable.

A motor equipped with this module is also well-suited when the motor is rotating, e.g. in a circular plate and powered via a slip-ring. Another typical application is where control signals are supplied from a hand-held or mobile, battery-operated unit.

A wide range of the most recent encryption standards can be used.

Like the well-known JVL RxP nano-PLC module, the MAC00-EW4 WLAN module is programmable so that small PLC programs can be executed directly in the motor. The graphic interface for setting parameters and programming in JVL's MacTalk software is identical to that of the RxP-module, and programs can be directly transferred between the RxP, BlueTooth and WLAN modules taking the use of I/O signals into account.

Connection of the supply and signals is done via three robust M12 connectors. The Module has a standard antenna connector for connection of the supplied antenna or other antenna of

choice.
Applications:
• Positioning of axles
• Monitoring motors
• Parameter set-up.
Functions:
• Provides full access to all of the MAC motor's functions and registers
• Possibility to connect thousands of modules
• Baud rates of up to 19200
• Remote control of the motor
• 5 inputs and 4 outputs
• Programmable via wireless control using MacTalk

JVL achieving great success in the USA

JVL International is pleased to announce that our headquarters in the USA, Trumation, Inc./JVL-USA has recorded significant growth in North American sales this year.

David Trudeau, President of Trumation, Inc. writes:

"For some time, motion control has been moving towards a distributed architecture where processes are controlled and monitored through network field busses. JVL has understood this and has refined an adaptable approach to the many protocols, thus providing a viable framework for future development."

The growth is mainly due to four reasons:
1. **JVL's quality and innovation** has allowed us to expand our distribution channels into more major markets using high-tech distributors that understand motion control and have the application know-how to support customers in selecting and implementing

products.
2. **The flexibility of JVL's modular system** of integrated MAC motors has allowed us to succeed in applications that competitive suppliers cannot adapt to.
3. **The built-in AC power supply in the MAC800** motors provides more power in a smaller package than anyone in the market and thus cuts costs by eliminating external power supplies.
4. **IP65/67 and UL recognition.**

This has allowed us to achieve sales success in industries such as:
1. **Aeronautics**, networking up to 400 motors together with actuators to create equipment for wing moulding and construction of exterior body parts.
2. **Printing,** where multiple print heads are networked for labelling food containers for major commercial vendors and suppliers.
3. **Winding/Unwinding applications,** controlling the feed rate and geometric profiles of the roll.
4. **Textiles,** where there is a need for feed rate control of the individual stands in the loom to create programmed patterns in the material.
5. **Packaging & Labelling,** coordinating with vision systems for registra-

tion and sorting.
6. **Food & Medical**, where cleaning, wash-down, and particle control are essential.
7. **Flying Cut-off applications** where our gear-following mode is simple to implement.

"In the coming year we plan more focused marketing in these and other areas so we can continue to enjoy this growth and provide quality products and service to these industries in the USA."