



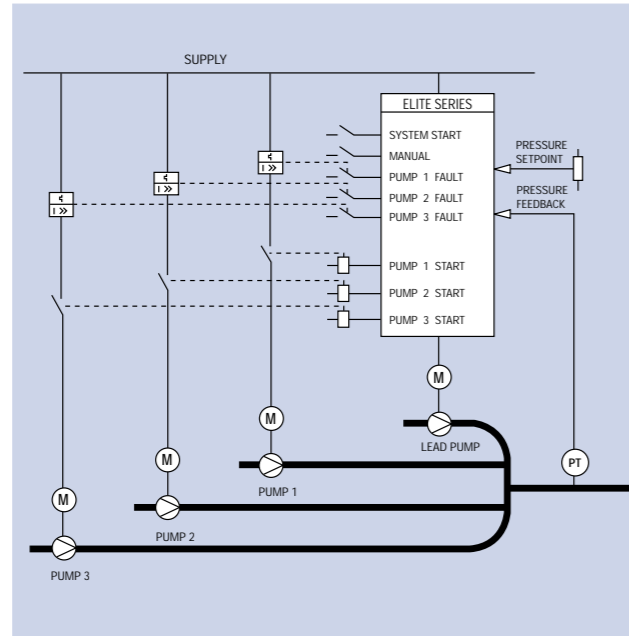
## VISTA Lead Pump System

The VISTA Lead Pump software has been designed to provide constant pressure control. The system uses an Elite Series to control the speed of a lead pump and to start and stop up to three fixed speed pumps. These fixed speed pumps are controlled via the Elite output relays.

A full PID controller within the Elite sets the speed reference for the lead pump. The fixed speed pumps are switched on and off on a setpoint deviation and time basis with hysteresis.

Special features include:

- A run time sharing algorithm decides which pump to switch, depending on the value of the fixed speed pump hour counters in an aim to keep the running hours for all fixed speed pumps the same.
- A faulty fixed speed pump will automatically be bypassed and a fault indication will be displayed.
- A minimum pressure alarm is generated if all pumps are running with the pressure remaining below an adjustable minimum for an adjustable time.
- Cavitation protection algorithm for the lead pump.
- PID bypass speed, selectable via digital input.
- Soft stop algorithm eliminates water hammer during stopping.

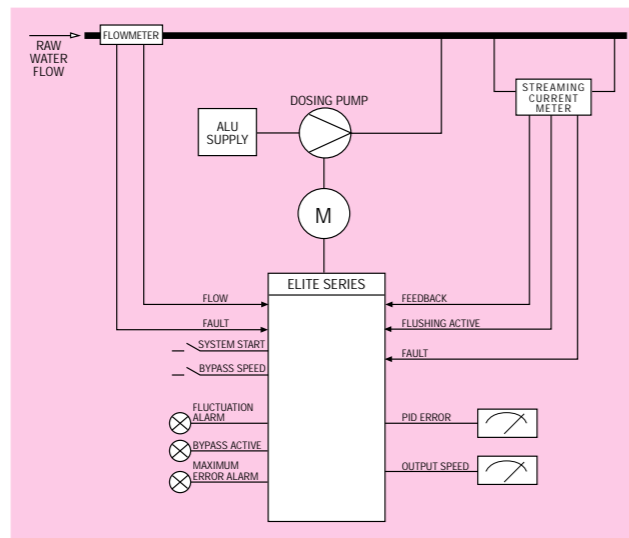


## VISTA Dosing Pump System

This particular Dosing Pump software has been designed to provide accurate dosing using a PID trim added to the scaled flow input as a speed reference. The PID uses an internal setpoint and the output of a streaming current meter as a feedback.

Special features include:

- Automatic PID bypass on streaming current meter fault or while flushing.
- PID only control under flowmeter fault conditions.
- Full control bypass, allowing the dosing pump to run with an adjustable 'bypass' speed reference.
- A maximum error alarm to indicate that the PID error has exceeded an adjustable value.
- A fluctuation alarm to indicate fast fluctuations in the PID error signal.

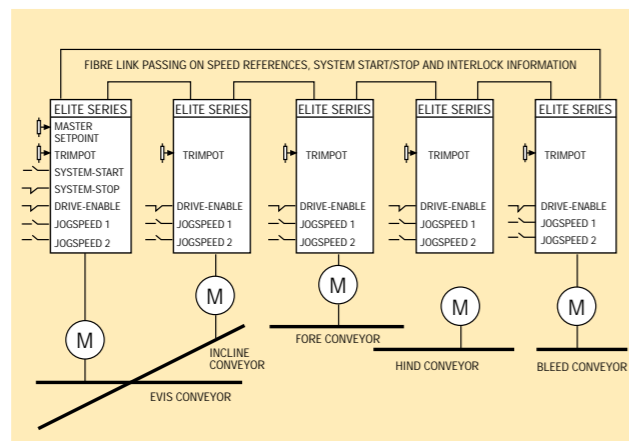


## VISTA Fibre Optics Speed Following System

In this example, the VISTA Fibre Optics Speed Following software has been designed to velocity synchronise five chain conveyors using the fibre link to pass on speed references, a system start/stop command and interlock information.

Special features include:

- Local enable input and two local inch speeds. These commands overwrite the fibre commands and allow for local control while the overall system is in run. This is mainly used to pre-position a conveyor.
- An adjustable ratio parameter makes compensation for various gear ratios possible.
- Local trimpot allows fine adjustments in speed. The trimpot adjusts the reference in percent.
- All interlocking is done via the fibre link, minimising cross wiring between the Elites.



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# VISTA

## AC Motor Controller Configuration Software



Introducing. . .

# VISTA

## About VISTA

VISTA is a visual programming platform developed by PDL Electronics Ltd for its Elite Series of AC motor controllers. VISTA enables the Elite Series of motor controllers to be totally customised to suit the control requirements of almost all applications. The need for further external control equipment such as PID controllers, small PLCs or dedicated logic circuitry is often eliminated.

The VISTA programming platform uses a graphical function block editor where process control function blocks can be assembled and interconnected to build customised applications. Over 90 function blocks are available. Most function blocks have little limitation on usage, resulting in greater control flexibility. Hence application functionality is generally only limited by the Elite's I/O and memory constraints.

Simple functions such as customising the Elite's alpha numeric display to indicate real units like flow rates, or creating multi-speed, multi-acceleration rate applications, to more complex functions such as crane control with limits, and multi-pump lead pump systems may be configured.

Once the control system is configured within VISTA, the program is then compiled and downloaded to the Elite via the inbuilt RS-232 serial port. The Elite Series have the capability to run this program as a real-time digital control system.

The Elite Series of AC motor controllers are sophisticated enough to store multiple application programs. Hence a pump controller may become a crane controller by simply selecting the appropriate program within the Elite.

VISTA can be separated into three main components: the Screenlist Editor, the Schematic Editor, and the Compiler.



## The Screenlist Editor

The Elite Series of AC motor controllers have a two line by 16 character remote mountable LCD, complete with a five-button membrane keypad. The remote display is used for editing and displaying drive parameters and variables. The display and functionality of the buttons can be totally customised with VISTA. Screens can be modified, added or deleted as required. Variables may be scaled and displayed as required. This is useful in depicting real units such as flow-rates, linear speed and ratios. Data can also be entered via the keypad, such as scaling factors, ratios, setpoints and parameter adjustments. More than one screen list per VISTA program is supported. For example, this enables selection of a truncated Screenlist or a full Screenlist. Hence VISTA provides a totally customised man-machine interface for a specific application.

## The Schematic Editor

The Schematic Editor employs a Graphical User Interface (GUI) where a logic schematic is created. The schematic is easily configured, by selecting the appropriate function blocks or icons, and linking or wiring them together using drop and drag techniques.

The platform is very flexible and contains the major process control function blocks that are typically available in digital loop controllers and PLCs. Salient function blocks include: PID loops, Boolean logic functions, counters, comparators, analogue switches, ramp controllers, rate limiters etc. Also standard arithmetic operators are available such as addition, division, multiplication, square root extraction, integration and trigonometric functions.

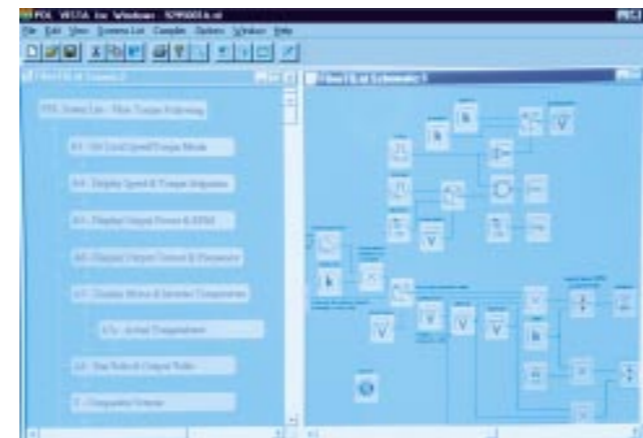
Program variables can be created within VISTA. The platform also allows access to many of the Elite's internal control variables such as frequency, current and torque. The VISTA program has the ability to control any internal parameter that is usually accessed by the screen or via serial communications, such as speed or torque operation, control of acceleration, deceleration and stop modes.

Alternatively the Elite's analogue and digital I/O can be monitored and controlled independently from the standard program functionality. This enables the Elite to perform its usual motor control tasks, but also to act as a remote terminal unit for another part of, or another process control system.

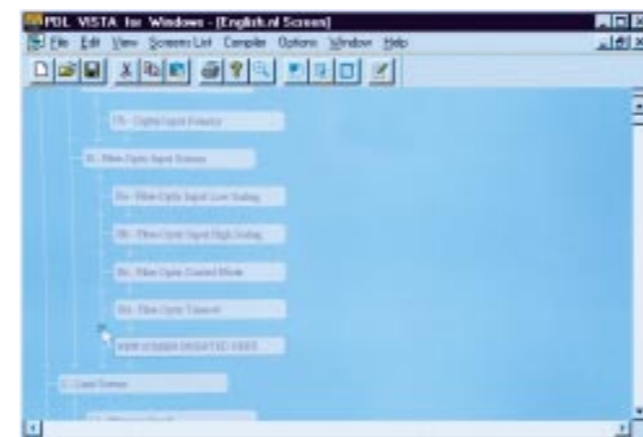
As the Elite uses FLASH memory for its program storage, program and drive firmware downloads are performed exclusively via the Elite's inbuilt serial port. There is no requirement to change EPROMs.

## The Compiler

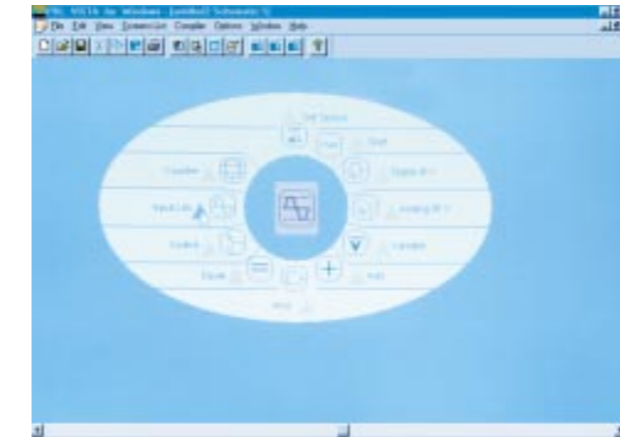
Once the Screenlist and Schematic components are complete, the file is saved in a netlist format. The VISTA netlist file is then compiled and downloaded into the Elite through an RS-232 serial link. Errors in the program configuration are detected and displayed during the compilation process. Multiple VISTA programs can be stored in the Elite. The only limitation is memory space. The standard Elite



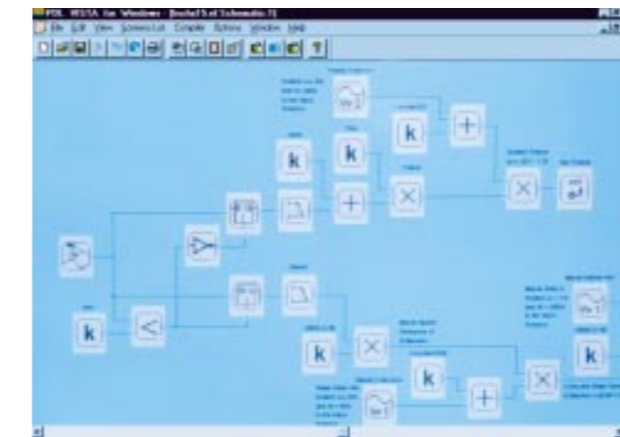
VISTA programs are configured within in the Screenlist Editor and the Schematic Editor.



Display screens are customised and created within the Screenlist Editor.



Function blocks are selected from an innovative oval menu.



A control schematic is configured using drop and drag techniques within the Schematic Editor.

## Applications

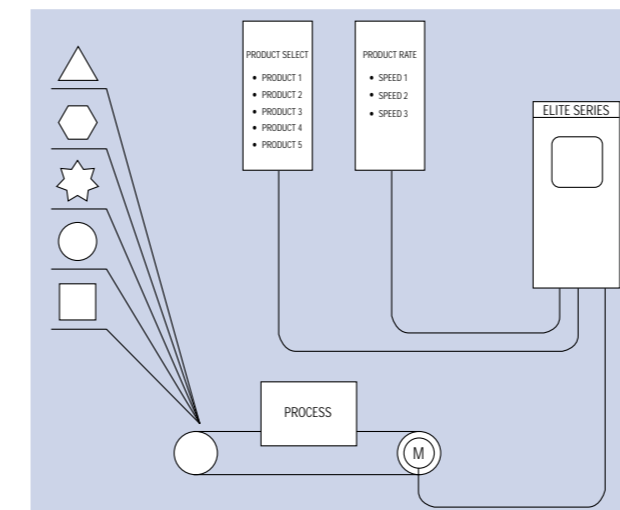
### VISTA 15-Inch Speeds

The Elite Series have several input modes that allow the digital inputs to be configured in various arrangements. One of these configurations uses three of the digital inputs to select from seven preset speed references plus zero.

Some industrial processes require a larger number of presets than provided by this standard configuration. VISTA allows the customisation of preset speeds, limited only by the number of digital inputs.

By using a binary combination of four of the digital inputs a larger data table can be constructed using VISTA, that can provide up to fifteen preset references plus zero. It is possible to expand the data table further using more of the digital inputs and provide for a greater number of preset speeds.

This allows for multiple production line speeds to be digitally selectable.



## VISTA Crane Modes

The Elite Series VISTA Crane Mode provides a customised solution for crane applications.

A common method of crane operation is by use of push button switches on a pendant. The push button switches are often two stage detent.

During operation of a two stage push button system, if no button is pushed, then zero movement is requested of the crane, the reference speed will be 0% and the Elite will operate in Stop Mode.

At the first detent of the push button, the Stop command is removed and the speed reference will be held at a predetermined value.

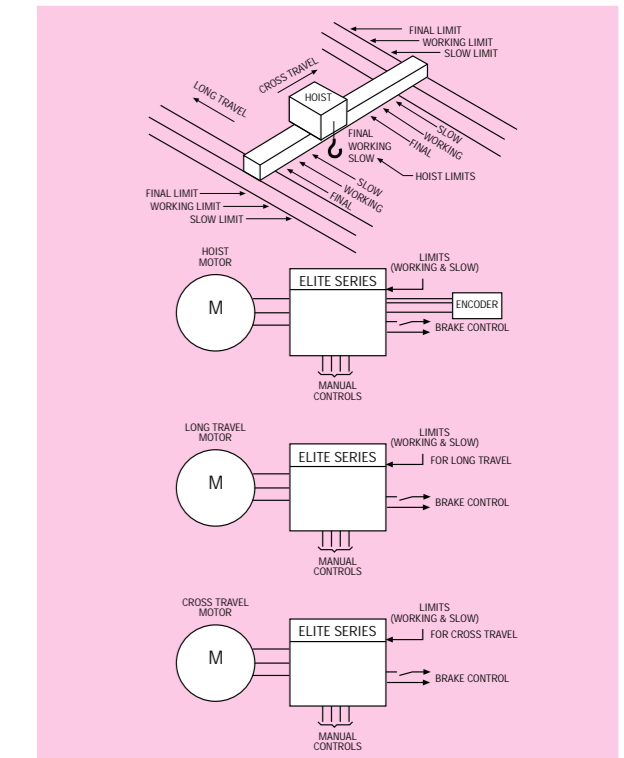
At the second detent of the push button, the speed reference will ramp up at a predetermined rate until the second detent is released. The Elite will then hold the speed attained during the ramp up, provided the first detent is still active.

On release of the push button, the Elite will decelerate the motor at a predetermined rate until the pushbutton is pressed again, or until the motor stops.

An alternative to two stage pushbuttons is joystick control where the speed signal is an analogue level derived from the joystick position. The joystick typically incorporates null-position switches that provide the Elite with a Stop signal while the joystick is in the centre position.

Typically, the control of an axis will also comprise various slow and working limits. While within the working limits the crane may attain full speed in either direction, however entering a slow limit will cause the crane to slow, but if the direction is reversed, full speed may be attained prior to leaving the slow limits.

VISTA allows for the basic crane modes to be modified to suit the particular installation. In particular the arrangement of the limits and the crane's behaviour within the limits may be customised.



## VISTA 4-Station Cable Car Control

The Elite Series is ideal for cable car applications due to the full torque at zero speed capabilities of the Closed Loop Vector mode, which provides smooth take-off and stopping. In addition, five of the digital inputs of the Elite can be utilised for travel control of the car. The sixth input provides Emergency Stopping. In some applications it may be possible to expand the number of Stations available to seven.

The Encoder required for Closed Loop Vector control is also monitored in the VISTA program and hence the position of the cable car can always be determined.

During commissioning, the approximate linear distance between stations is loaded into the VISTA program contained within the

Elite. This information is then used to determine the actual location of the car and to compare this to the destination required. With only one Digital Input available for the four destination Stop signals, the Elite will automatically determine which station to stop at.

When a Call is made, the Elite determines, from the present location of the cable car, which direction the cable car must travel in. The cable car accelerates in that direction, passing other Stations and ignoring those stop commands. Approaching the destination, the Elite will decelerate to Inch Speed and then stop on the valid stop command.

