Deneb – DE

Multi Digital Servo Control System

Deneb DE is a multi-direct digital microprocessor control system and designed for dynamic and static tesing applications. Deneb DE is a multi-channel, multi-station unit that uses a Windows based graphical user interface to provide an extremely flexible and easy to use controller.

Sabio – D

Synchronized Multi Axes Control Software

As an independent controller for multi-axis simultaneous control, it has various built-in conditioners and amplifiers, and helps each element control flexibly through the use of exclusive software.

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Main Controller

- Desktop type / Rack mounting type (Selectable)
- Dimension 33cm width × 50cm height × 50cm depth
- Number of axis : 8 axis
- Real-time frequency equalization :
  2kHz (Sampling rate)
- Control command resolution : 64bit
- Hydraulic service manifold control
  (On/off/low/high for each axis)
- Servo valve control drive : 8 channel
- LVDT conditioner : 8 channel
- Loadcell Amplifier : 8 channel
- External a/d input signal : 16 channel
- External analog output signal : 8 channel

Valve Drive

- Servo valve current : 20, 40 or 100 mA (Selectable)
- Input voltage : +/-10V(for voltage)
- Calibration : Adjustable (Gain, Zero)
- Dither : Adjustable (Frequency, Level)

LVDT Conditioner

- AC (Full bridge, Half bridge, LVDT),
  DC (Resistors, Encoders, IRC)
- AC conditioner :
  Input terminal voltage 5 kHz,2,5(5) Veff
- DC conditioner : Input terminal voltage +/-10V
- 19bit signal resolution

Loadcell Amplifier

- Analog strain-gage transducer type
- Bandwidth: 3KHz
- Low pass filter: 3300 ,330, 33, or 3.3Hz selectable
- Excitation : 10VDC
- Load cell capability : 350~1000 Ohms

Controllable Inputs

- 2 external analog Input for a each axis
- Resolution : 16 bit
- Range : -10~10 V

Digital I/O

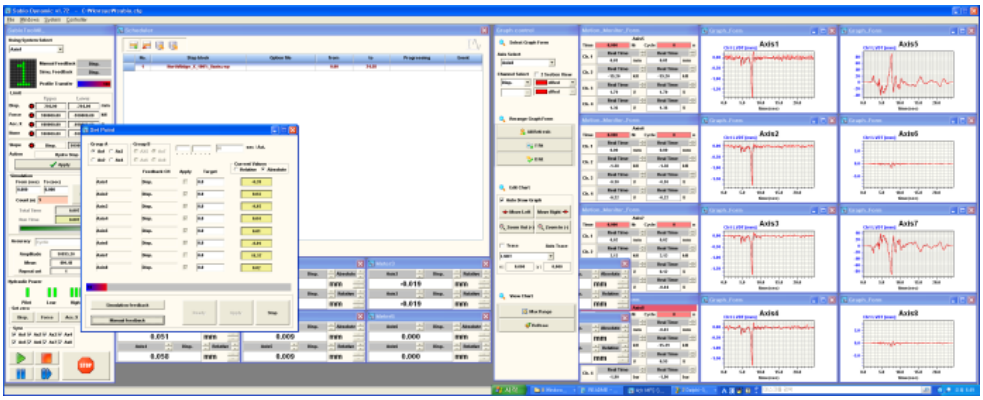
- 6 in / 4 out
- Input : Opto-isolated input, 5~24V
- Output : 2 wire normal open relay (5A 30VDC, 5A 250VAC)

Jog Switch

- Power on/off
- Pause / Function / EMG Button
- Jog up/down

Sabio – D

Synchronized Multi Axes Control Software



As dynamic control software for synchronous multi-axis control, Sabio-D performs various tests of durability and multi-axis simulation in reliability. Sabio-D has to take pride in correct control performance and convenient GUI. In addition, Sabio-D offers continuous upgrade service through the feedback from consumers.

The newest technique introduces to meet condition of linear and nonlinear PID control. Also, Sabio-D has various application software.

Synchronized Multi Axis Control

- Remote control device :
  Emergency stop, Actuator remote jog and Hydraulic pressure on/off s/w on junction control panel
- Control mode : Disp. /Load/Strain/Stress/Ext. Sensor/User defined control
- Control method : PID control + Feed-forward control
- Amplitude-Mean compensator
- Amplitude-Phase compensator
- Monitoring port for analog channels : Disp., force, acceleration, external sensor, etc
- Digital conditioner : Displacement, Force
- Auxiliary channels : Analog input(ADC), Analog output(DAC) and Digital input/output
- Dual monitor type display : Applied
- Data saving & Loading file format : RPC III, Rigsys, Exel, ASCII

Advanced Control

- Road load profile simulation
- On-line Iteration Function
- System identification method
- Adative harmonic cancellation method
- Three variable control method (Displacement - Velocity - Acceleration)

Setup and Configuration

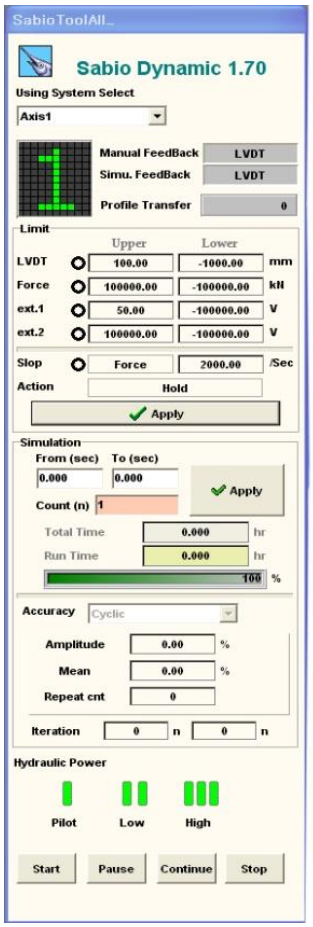
Setup File Save/Open
: File/Registry Save
: Calibration Data/Unit
: Axis/Sensor Information
: Control variable/Tuning parameter
: Filter information

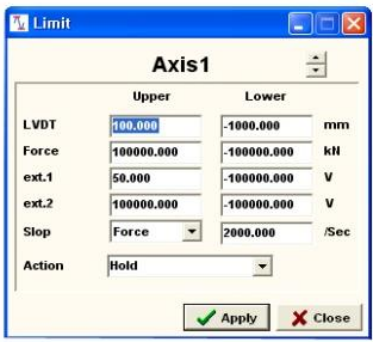
Report Function : Format
: ASCII, RPC III, Rigsys, MS Office Excel

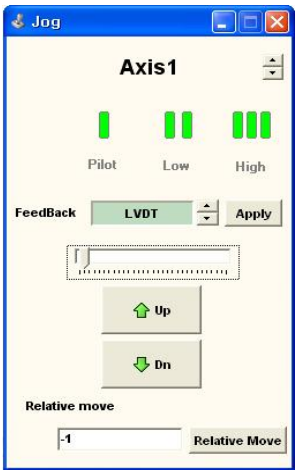
Limit Detectors for Each Axis and Channel
: Event function for limit detection
: Configuration iimit action
: Limit monitoring (Limit axis, Channels & Variables)

Supporting Save/Open Schedule Project File on Disk

Test Log File Save
: Command
: System status & cycle
: Limit information
: Emergency





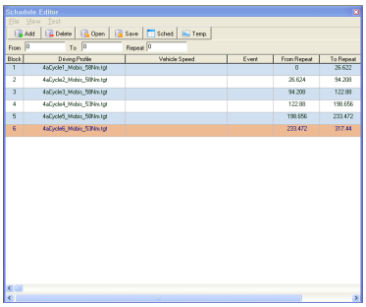


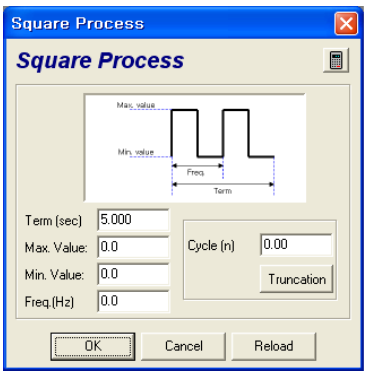
Cyclic Waveform Generation

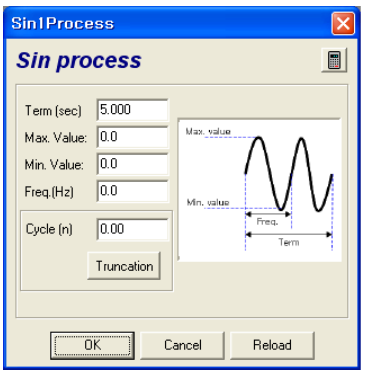
Cyclic Waveform Generation
: Line to (Ramp), Sine, Square, Triangle, Trapezoidal, Connector

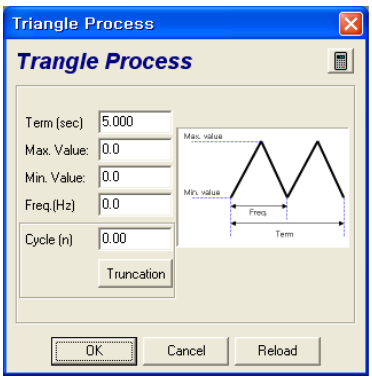
Stepped Sine Waveform
: Block loading, Schedule editor (Procedure table)

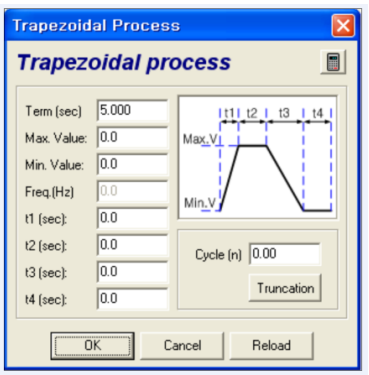
Sweep & Random Signal Generation
: Increase/Decrease frequency/Ampitude of sine signal
: Specify frequency rate
: Sweep amplitude
: Random signal











Plotting & Data Display

Display

: Real-time data scope

: Multi channel scope for each axis

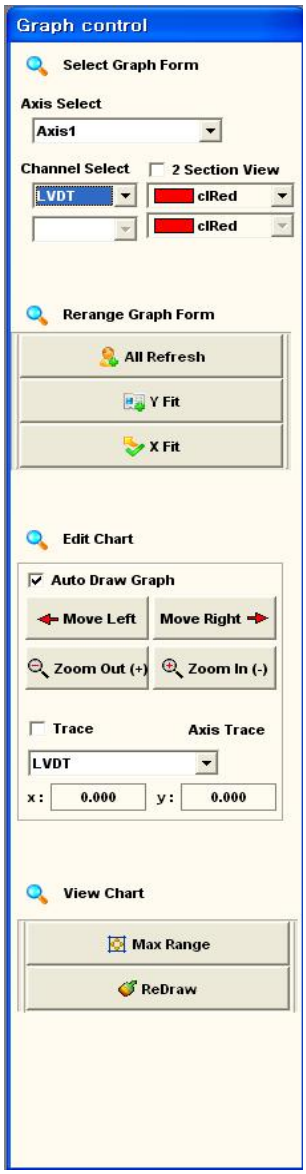
: Complex graph – XY scope

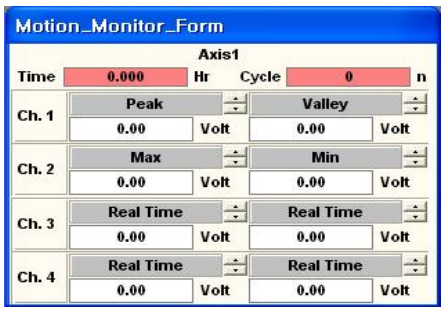
: Monitor meter

(Real-time data digit, Peak/valley, Max/min, Mean)

: System inspection

Hydraulic power supply,
Hydraulic service manifold,
Control ready/connection,
Emergency/limits detection





Data Save

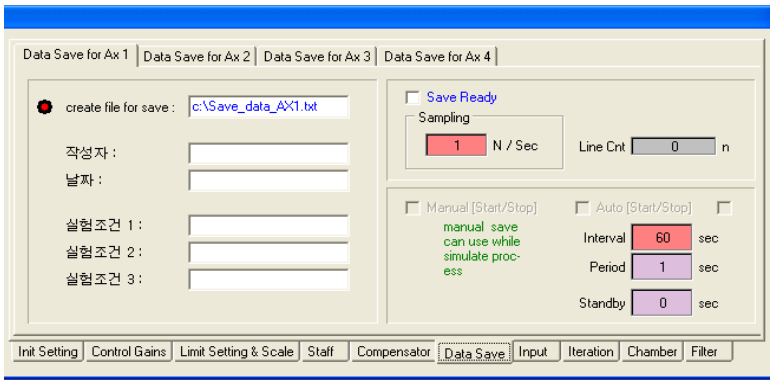
File Save Function

: Format : ASCII, RPC III, Rigsys, MS Office Excel

: Continuous data storing method

: Min/Max data storing method

: User defined sampling rate



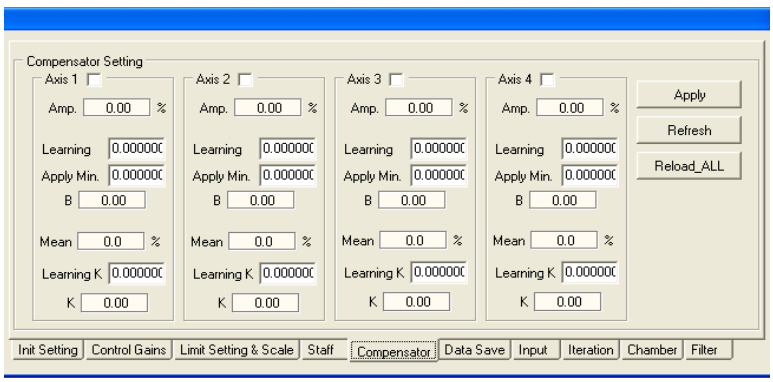
Compensation

Amplitude Phase Compensation

: Compensation technique that monitors sensor‘s feedback and detect/ compensate amplitude error or phase lag.

Amplitude/Mean Compensation

: Compensation/Detection for amplitude error & mean error



System Identification

- Tool Identificating method that build dynamical mathematical from measured data of the dynamic behavior of a system
- System input type setting : Sweep, GWN, Binary MLS
- Input variable setting : Amplitude, Frequency, etc.
- Preprocessing : Normalization, Re-sampling, etc.
- Model set : ARX (Black box model)
- Inverse model convergence
- Inverse feedforward control

On-Line Iteration

- Recursive online control method
- Concept for the repeatability of operating a given objective system and the possibility of improving the control input on the basis of previous actual operation data

Adaptive Harmonic Cancelation

- The adaptive harmonic canceller (AHC) removes unwanted harmonics from a sinusoidal feedback signal
- Adds a signal to the program with just the right amplitude frequency to completely cancel the unwanted harmonic signal
- Because cancellation occurs at the system output by means of a signal at the system input, the phase response of the system must be known. Before cancellation is turned on, it must learn the system phase response by commanding the system with a sine sweep or a random signal over the frequency range of operation. This ‘training’ range must be high enough that all of the harmonics required to be cancelled are included.

Three Variable Control

- Uses displacement, velocity and acceleration terms to accurately control the system’s entire operating range, especially at high frequencies.