



# Advance Process Control Platform with DAQ Nvis 3002A



**Nvis 3002A Advance Process Control Platform** is a complete setup to control process through two point (ON/OFF) and three point (PID) controller. It has two processes-Temperature and Liquid level which we can control through an Ethernet based Data Acquisition System which has 24 bit ADC and digital input/output. Nvis 3002A also gives the exposure to Industrial components like Level Transmitter, Temperature Transmitter, Valves, DAQ, PID controller and Sensors. Users can learn how to calibrate, install, operate and tune the instruments for controlling the process. All electrical components are connected to the control panel to allow students to measure signals and connect the devices in wide variety of control configuration including open loop (manual control) and close loop (PID control, ON/OFF control).

Nvis 3002A comes with a versatile Software through which we can control it from any Computer in the local area network. The Software has features like logging of the process data, live and stored graphs that can be printed when needed, alarms that can be set for different points, animated real time view of complete process, with easy IP configuration.



# Advance Process Control Platform with DAQ

## Nvis 3002A

### Features

- Use of Industrial Process Control elements
- Heavy duty bench Workstation
- Electrical Control Panel
- Capacitive Level Sensor
- Temperature Transmitter
- Interface with Ethernet based DAQ
- 8 Channel 24 bit ADC
- Din rail mounting for DAQ
- Process Control concept
- RTD Sensor
- Thermocouple Sensor
- Start , Stop , Emergency Stop button , Indicators for Pump, Heater , Stirrer, Solenoid Valve, Audio Indicator, Visual Indicator
- 2 Types of Controller : PID Control , DAQ Control
- Process Loop Tuning & Stable Process
- Real-time DAQ interface with ADC & Digital input/output
- Process Control by ON/OFF Controller
- Process Control by PID with Auto tuning
- Process Control loops
- Temperature Measurement and Control
- Automatic and Manual Control
- Leak proof Safety measures and sturdy piping
- Enhanced Electrical Safety considerations
- Heat Transfer concepts
- Transducer/Transmitter Calibration
- Piping and instrumentation diagram
- Built-In Instrumentation
- Sump tank for inlet and outlet of water
- User Friendly Software
- Robust construction
- Platform with Caster wheel arrangement for ease in movement
- Online Product Tutorial

### Scope of Learning

#### Study and use of:

- Process Control Platform using Software
- RTD characteristics.
- Thermocouple characteristic
- Temperature Transmitter characteristics
- Level Transmitter characteristics
- Alarm function
- Open loop for Temperature.
- Temperature on/off action using Software
- P, PI and PID control action using the Software for Temperature
- Industrial PID Controller as on/off Controller
- Industrial PID Controller as P, PI and PID Controller
- Auto tuning mode of Industrial PID Controller
- Open loop for Level
- Level On/Off Controller using Software.
- Level P, PI and PID Control action using Software.
- Study of Thermal Process





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### Technical Specifications

<b>Push to ON Switch:</b>	<b>: 6</b>	<b>Level Transmitter</b>	<b>: 1</b>
<b>Toggle Switch</b>	<b>: 5</b>	Supply Voltage	: +24V DC
<b>Indicator Lamp</b>	<b>: 5</b>	Output Voltage	: 4ma to 20mA
<b>Emergency Stop Switch</b>	<b>: 1</b>	Cable Entry	: 2 X 1/2" BSP, SC gland brass
<b>Audio Indicator</b>	<b>: 1</b>	User Interface	: 4 digit display+4 Keys
<b>Process (Measuring) Tank: 1</b>		Read out	: 0- 100%, 4-20mA LED (red), Digital, 2-1/2
Capacity	: 15 Litres	Outputs	: 4-20 mA PNP output ( 3 wire ) or galvanically isolated (4 wire loop) ( User selectable) 4 - 20 mA output is over current safe and compatible with PLC Measurement range : 10-50000 pF.
Material	: Stainless Steel (SS304)		: Calibration : Calibratable over measurement range.
Dimension	: 300 X 315 X 250 mm		: Calibration method : Easy ( Using DIP Switches )
<b>Supply (Sump) Tank : 1</b>		Sensing rod material	: Stainless Steel (SS304)
Capacity	: 30 Litres	Insulation	: Full PTFE
Material	: Stainless Steel (SS304)	Mains	: +24V DC @25mA ( reverse polarity safe )
Dimension	: 500 X 315 X 250 mm	Probe Length	: 250mm
<b>Temperature Sensor : 1</b>		<b>Temperature Transmitter: 1</b>	
Type	: RTD (PT100)	Input RTD	: Pt100 3 wire
Wire	: 3 Wire	Output	: 4 - 20mA, two wire
Rod Length	: 9"	Accuracy	: ±0.1% of the calibrated span
Temperature Range	: (-99 to 850°C)	Loop Supply	: 24V DC nominal (12 to 36)V DC
<b>Thermocouple Sensor : 1</b>		<b>Electrical Control panel</b>	: MS Powder coated panel with Switches, indicator, Test Points, PID and DAQ, A m m e t e r o n f r o n t f a c i a , DAQ mounted on DIN rail channel, multistrand wire with proper insulated, lugs, ferruling & neat wire dressing & clamping
Type	: K Type		
Wire	: 2 Wire	<b>Industrial PID Controller : 1</b>	
Rod Length	: 9"	Input	: RTD (PT100), K type Thermocouple
Temperature Range	: (-200 to 1250°C)	Display	: 7 segment LED, dual display
<b>Heater : 1</b>		Control Action	: PID & ON/OFF
Supply	: 230 V AC (1000Watt)	Supply Voltage	: 230V AC
<b>Ammeter : 1</b>		Relay Action	: Forward for cooling and reverse for heating
Range	: 0 to 5A, 0.2% resolution	<b>Water Pump : 1</b>	
<b>Solenoid Valve : 1</b>		Flow Rate	: 3800L/h
Supply Voltage	: +230V AC	Operating Voltage	: 165 -230 V AC
Type	: 2/2		
Port size	: 1/2"		
Pressure range	: 0-10kg/cm <sup>2</sup>		
<b>Stirrer : 1</b>			
Supply	: 12 V DC		



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- Piping** : 1/2" PVC
- Drain valve** : 1
- Size** : 1/2"
- Size** : 1/2"
- Computer Interface** : Ethernet
- Caster Wheel** : 4 nos
- Dimension (mm)** : W 3850 X D 1400 X H 1400
- Weight** : 75Kgs (Approximately).
- Power Supply** : 230V ± 10%, 50 / 60 Hz

### Data Acquisition System (DAQ)

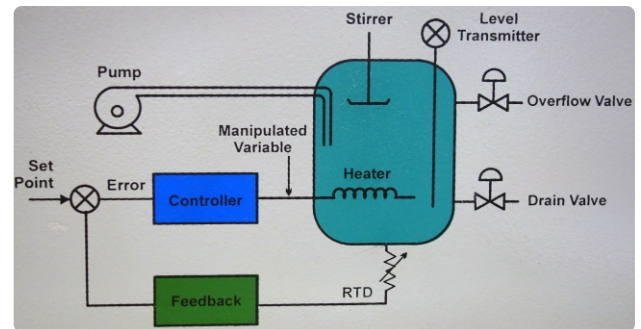
- Analog input** : 8
- Analog output** : 2
- Digital input** : 8
- Digital Output** : 8
- ADC Resolution (In Bit)** : 24
- Unity gain amplifier(Buffer):** 2 (0-5V)
- USB** : Yes
- Ethernet** : Yes
- Data Login (PC based)** : Yes
- UART Interface** : Yes
- Software** : Yes

### List of Accessories

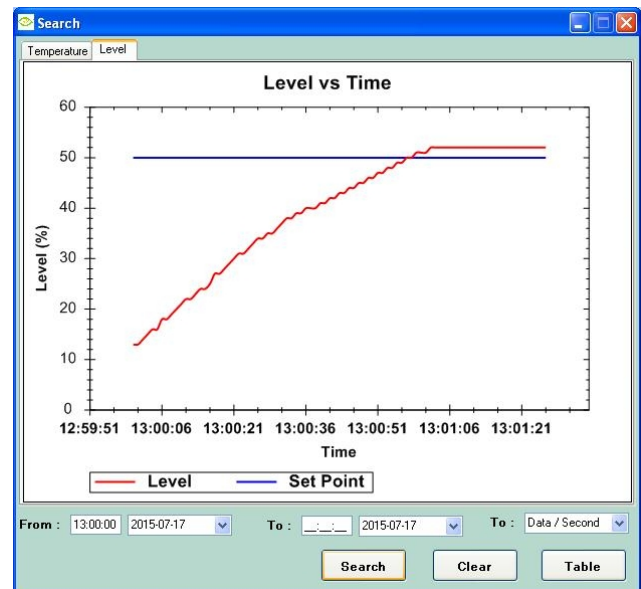
- Mains Cord** : 1
- Ethernet Cable** : 1
- Panel Gate Key** : 1
- Drawer Lock Key** : 1
- Flexible Pipe** : 1 meter
- Product Tutorial** : Online



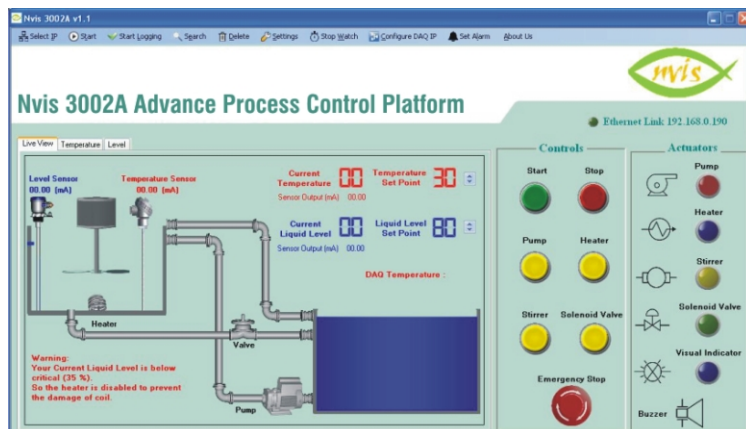
Flow diagram



Graphical View



### Nvis 3002A Software window



Designed and Manufactured in India by -

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