

Automation for a Changing World

Delta CNC Lathe Solution Lathe Controller NC200 Series



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 **DELTA**
Smarter. Greener. Together.

Delta CNC Lathe Solution - Lathe Controller NC200 Series

Delta's CNC Lathe Solution adopts the CNC Controller NC200 Series to control servo systems, a spindle servo drive, and a PM spindle motor. With Delta's DMCNET protocol that provides high-speed data exchange, the solution is able to perform precise turning control and meet the machining requirements for high speed and high precision.

Features

- Embedded system design: high energy savings, high efficiency and high stability
- 8-inch high resolution color LCD: three kinds of operation interfaces, English / Traditional Chinese / Simplified Chinese
- User-friendly operation: provides interfaces with simple steps to meet users' requirements
- Delta's global service network: professional technical support and excellent service

Product Design and Main Specifications

Non Manual Pulse Generator (MPG) (NC200A-LI-A) With Manual Pulse Generator (MPG) (NC200P-LI-A)



Separate Type (NC200A-LS-A)



- Maximum control: 5 axes
Simultaneous control: 3 axes
- Single spindle and single turret applications
- Cost-efficient all-in-one type CNC controller
- Delta's DMCNET protocol
- Compatible with ISO standard G codes
- C-axis function

CNC Lathe Solution

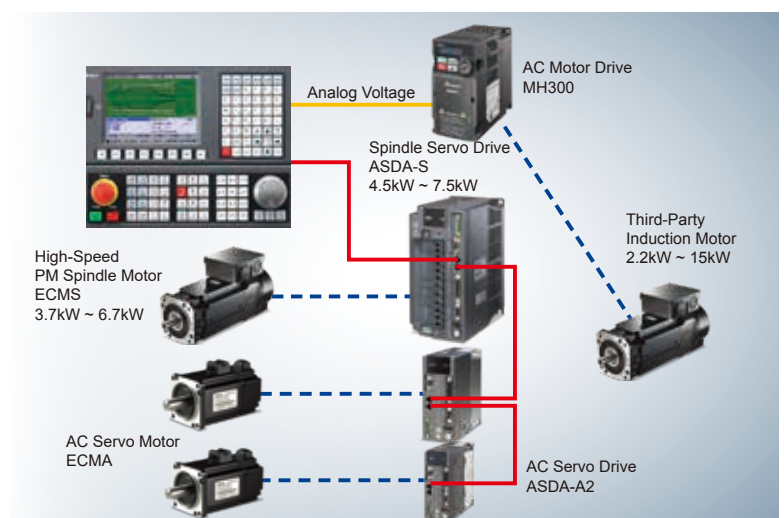
System Application Flexibility

Application 1

- DMCNET Communication with Spindle Servo Drive

Application 2

- Analog Signal with AC Motor Drive

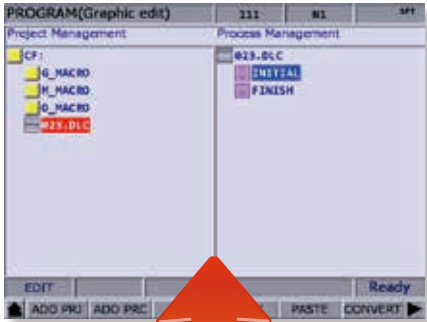


Lathe Functions

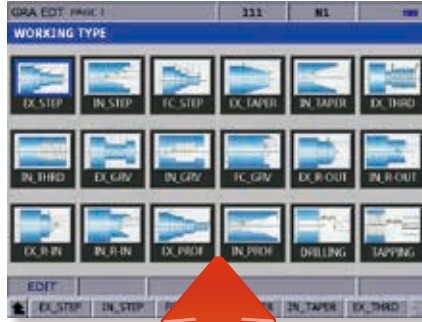
CNC Lathe Programming

- Simple interface design and steps for quick programming and processing management

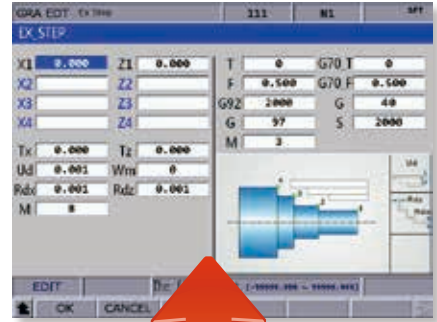
Graphical programming steps:



Step 1:
Click the Process Management function



Step 2:
Select the Working Type function

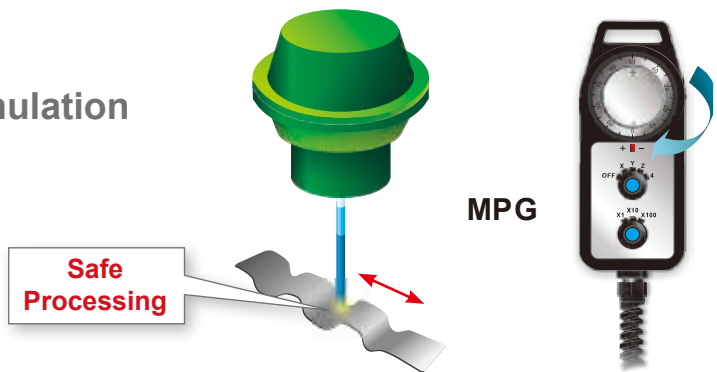


Step 3:
Fill in working steps

Step 4: Complete NC code programming
The same workpiece can be employed with different processing combinations

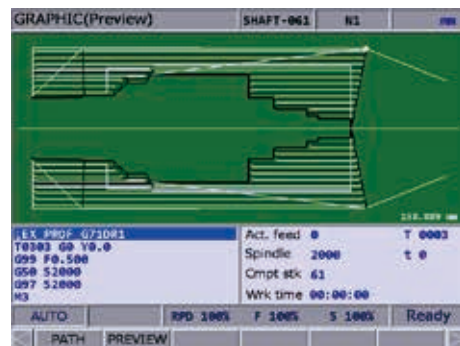
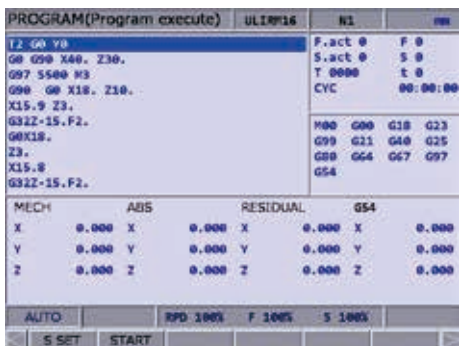
Manual Pulse Generator (MPG) Simulation

- Controls processing speed and guarantees cutter stability to prevent execution error or tool damage from inaccurate operation for safer and more precise CNC processing



Graphical Preview of Tool Path (Look-Ahead Simulation)

- Provides graphical preview of tool paths to simulate, check and observe the movement of the tools for verifying and optimizing the NC machining programs before processing, which reduces defect rates



NC 200 Series Lathe Functions

Lathe Cutter / Tool Chart

OFFSET (Tool Offset)				111	N1	mm
Num	X OFFSET	Z OFFSET	RADIUS	POINT		
1	0.000	0.000	0.000	0	MECH	
2	0.000	0.000	0.000	0	X	90.000
3	0.000	0.000	0.000	0	Z	190.000
4	0.000	0.000	0.000	0		
5	0.000	0.000	0.000	0		
6	0.000	0.000	0.000	0		
7	0.000	0.000	0.000	0	REL	
8	0.000	0.000	0.000	0	X	90.000
9	0.000	0.000	0.000	0	Z	190.000
10	0.000	0.000	0.000	0		
11	0.000	0.000	0.000	0		
12	0.000	0.000	0.000	0		
13	0.000	0.000	0.000	0		
14	0.000	0.000	0.000	0		
15	0.000	0.000	0.000	0		

OFFSET (Tool Wear)				111	N1	mm
Num	XWTA	ZWTA	RAD WTA			
1	0.000	0.000	0.000		MECH	
2	0.000	0.000	0.000		X	90.000
3	0.000	0.000	0.000		Z	190.000
4	0.000	0.000	0.000			
5	0.000	0.000	0.000			
6	0.000	0.000	0.000			
7	0.000	0.000	0.000		REL	
8	0.000	0.000	0.000		X	90.000
9	0.000	0.000	0.000		Z	190.000
10	0.000	0.000	0.000			
11	0.000	0.000	0.000			
12	0.000	0.000	0.000			
13	0.000	0.000	0.000			
14	0.000	0.000	0.000			
15	0.000	0.000	0.000			

Recording Processing Data

- Records processing details to verify processing time and the amount of completed stocks

DIAGNOSE (PROCESS)		111	N1	SPT
Total time	133: 06: 25			
Single time	00: 03: 38			
Target stocks	10			
Completed stocks	10			
Date	2017/02/21			
Time	14:55:46			

Integration with Servo System

- Provides auto-gain tuning and compensation function for calculating parameters and controlling servo drives, and integrates with the CNC system, Delta's AC servo system and the HMI for outstanding motion control

DIAGNOSE (Servo Monitor)							111	N1	SPT
Ch	Axis	Cont.	Rdy	Load	Peak	MECH	Home	Abs. Rat.	
0	X	OK	OK	1 %	7 %	90.000	OK		
0	Z	OK	OK	0 %	9 %	190.000	OK		
0	SP1	OK	OK	0 %	7 %	0.000	OK		

Servo Parameter Name and Values

DIAGNOSE (Servo Tuning)				111	N1	SPT
No.	Parameter Name	Calculate	In Drive			
P1-37	Load Inertia Ratio	1.0	1.0			
P2-00	Position Loop P gain	35	35			
P2-02	Position Feedforward	50	50			
P2-04	Speed Loop P gain	500	500			
P2-05	Speed Loop I gain	100	100			
P2-25	OSC Reject Filter	2	2			
P2-26	External Noise Reject	0	0			
P2-49	Speed D Filter and I Suppression	100	1000			
P2-47	Auto Resonance Suppression Sel	1	1			
P2-23	Notch filter Freq(1)	1000	1000			
P2-24	Notch filter Gain(1)	0	0			
P2-43	Notch filter Freq(2)	1000	1000			
P2-44	Notch filter Gain(2)	0	0			
P2-45	Notch filter Freq(3)	1000	1000			
P2-46	Notch filter Gain(3)	0	0			

Positioning Points Setup

MECH	90.000
POS 1	-----
POS 2	-----
Rigidity	1
BW	100 Hz
JL/Jm	4.0
Acc. Time	200
S Time	20 ms
Speed	3000 mm
Interval	500 ms

Tuning Criteria

Auto-gain Tuning Result

Current Servo Parameter Values

Other Functions

Remote Monitoring & Data Synchronous Management

- Connects the NC 200 Series with a personal computer via an Ethernet communication network for remote monitoring synchronously managing the programs and data of the controllers

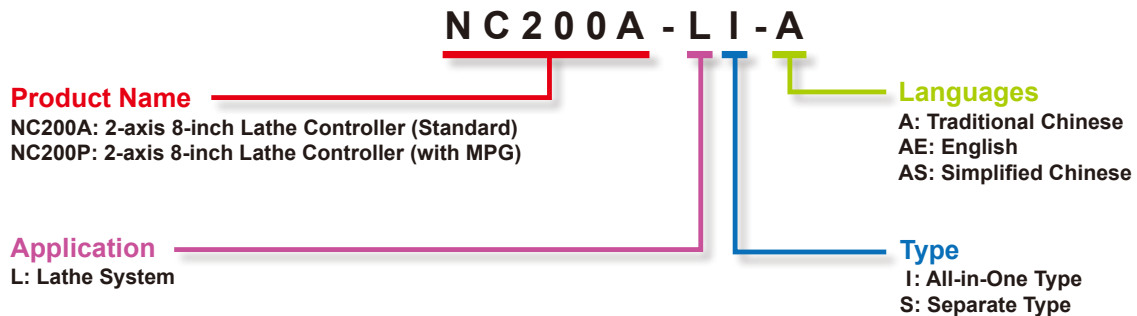
Barcode Application

- Connects barcode readers to the NC200 Series via USB to rapidly scan and input files with barcode names for filing and processing, which saves data searching time

User Authority

- Allows users to assign authority levels and register passwords to set permissions for different users' security control
- Authority management includes system, machine and user (operator) to enhance operation safety

Ordering Information



Electrical Specifications

Models	NC200A-LI-A □	NC200P-LI-A □	NC200A-LS-A □
Operation Environment	10% ~ 95% RH [0 ~ +55 °C]		
Storage Environment	10% ~ 95% RH [-20 ~ +60 °C]		
Cooling Method	Natural Cooling		
Operation Voltage	DC +24V (-10% ~ +15%) (has built-in isolated power circuit)		
Voltage Endurance	AC500V for 1 minute (between charging DC24V terminal and FG terminals)		
Power Consumption	24V 0.6A 15W		
Backup Battery	3V lithium manganese battery CR2032 x 1		
Backup Battery Life	Depends on temperature and usage condition: around 3 years or more under 25° C		
Dimensions (W) x (H) x (D) mm	400 x 320 x 91	400 x 320 x 130	400 x 200 x 93
Weight (kg)	4.5	4.7	3.4

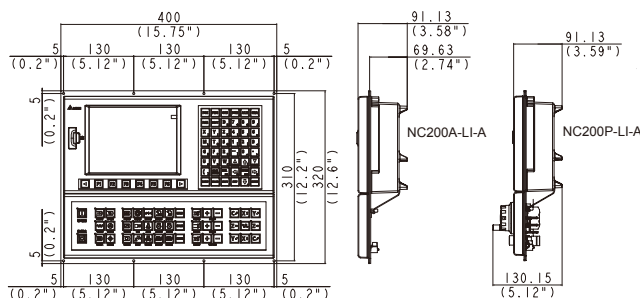
Standard Specifications

	Model Name	DELTA NC200A/P
Product Specifications	Max. number of main systems	1
	Max. number of PLC control axes	Max. 5 axes
	Max. number of NC controlled axes (standard)	5 axes
	Max. number of spindle axes	1
	Max. number of simultaneous controlled axes	3 axes
	Least control unit (mm)	0.0001
	Max. number of workpiece coordinate sets	70 (6+64)
	Max. number of tool offset sets	64
	Preview control (single block)	500
	Single block processing time (single block/second)	1000
Hardware Specifications	Standard I/O	8 inputs / 5 outputs
	Optional I/O	Max. 32 inputs / 32 outputs for one remote I/O port; Max. 8 sets of 256 inputs / 256 outputs for extension
	DA	1 set
	Display	8-inch LCD color display
	RJ-45	2 sets
	RS-485	1 set
	CF Card	1 set
Compensation	Backlash compensation	○
	Pitch error compensation	○
	Acute-angle compensation	○
Operation	MPG simulation	○
	Dry run	○
	Optional stop	○
	Single block execution	○
	Pause point start	○
	Breakpoint start	○ (breakpoint)
	External offset setting	○
Program Input	Optional skip	○
	Subroutine call	○ (M98)
	Acceleration / Deceleration constant of S-curve	○
	Automatic corner deceleration	○
	Circular radius speed limit	○
	Multiple groups of high-speed and high-precision parameters	○
Auxiliary Functions	Machine lock	○
	Software stroke limit	○
	Serial tuning function	○ (gain tuning function)
	Rapid spindle positioning	○ (M29)
	Data backup restore	○ (parameters import and export)
	Startup screen customization	○
	Authority management	○
Program Editing	Background editing	---
	Editing protection	○
Data Transfer	Ethernet (between PC and CNC side)	○
	DNC via Network	○
	DNC via USB	○
Data Display	Graphic simulation	○
G-code	G90 Outer diameter / inner diameter turning cycle	○
	G92 Thread turning cycle	○
	G94 Endface turning cycle	○
	G31 Skip function	○
	G32 Thread cutting	○
	G34 Variable pitch thread cutting	○
	G54 ~ G59 Workpiece coordinate system setting	○
	G70 ~ G76 Multiple cutting cycle	○
	G92 Absolute zero coordinate system setting	○
	G96 Constant surface cutting speed	○

Dimensions

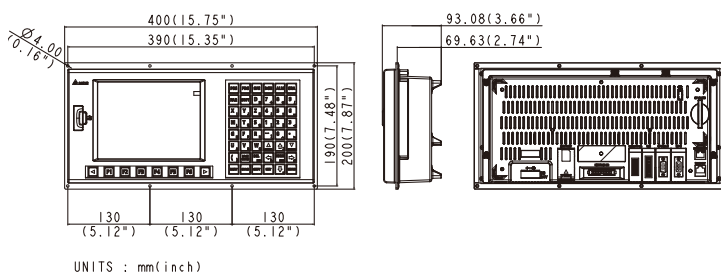
NC200A-LI-A

NC200P-LI-A



Cut-outs and Mounting Dimensions

NC200A-LS-A





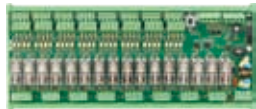
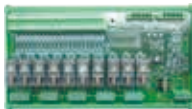
Cut-outs and Mounting Dimensions

UNITS : mm (inch)





Units: mm (inch)

Optional Accessories

High Speed Serial I/O

I/O Cable	Photocoupler Type	Relay Type	Relay Type
 <ul style="list-style-type: none"> • 1.5 / 3.0 / 5.0 / 10 m • Part No.: 1.5m NC-CAB-EIO015 3.0m NC-CAB-EIO030 5.0m NC-CAB-EIO050 10m NC-CAB-EIO100X 	 <ul style="list-style-type: none"> • 32 Inputs / 32 Outputs • Part No.: NC-EIO-T3232 • Size: 286 mm x 121.78 mm x 51.01 mm (Length x Width x Total Height) 	 <ul style="list-style-type: none"> • 32 Inputs / 16 Outputs • Part No.: NC-EIO-R3216 • Size: 286 mm x 121.7 mm x 54.73 mm (Length x Width x Total Height) 	 <ul style="list-style-type: none"> • 20 Inputs / 10 Outputs • Part No.: NC-EIO-R2010 • Size: 217 mm x 121.79 mm x 60.56 mm (Length x Width x Total Height)

Converter

6-Axis Pulse Converter	AD Converter	DA Converter	Other
 <ul style="list-style-type: none"> • 6 Axes of Pulse Output • Part No.: NC-EIO-PMC06 • Size: 217 mm x 121.78 mm x 41.9 mm (Length x Width x Total Height) 	 <ul style="list-style-type: none"> • Analog Input Type (4 channel ADC) • Part No.: NC-EIO-ADC04 • Size: 146.25 mm x 86.78 mm x 51.05 mm (Length x Width x Total Height) 	 <ul style="list-style-type: none"> • Analog Output Type (4 channel DAC) • Part No.: NC-EIO-DAC04 • Size: 146.25 mm x 86.78 mm x 51.05 mm (Length x Width x Total Height) 	 <ul style="list-style-type: none"> • Manual Pulse Generator • Part No.: NC-MPG-105HS-FL • Size: 184 mm x 73 mm x 71 mm (Length x Width x Height)



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