



Automation for a Changing World

Delta CNC Lathe Solution Lathe Controller NC200 Series



www.deltaww.com

 **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 3-axis servo systems, a spindle servo drive, and a PM spindle motor. Through Delta's DMCNET protocol, it provides high-speed data exchange and precise turning control to satisfy 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: simple and easy-to-use interface with simple steps to fulfill market requirements
- Delta's global service network: professional technical support and excellent service

Product Profile & Outline

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



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



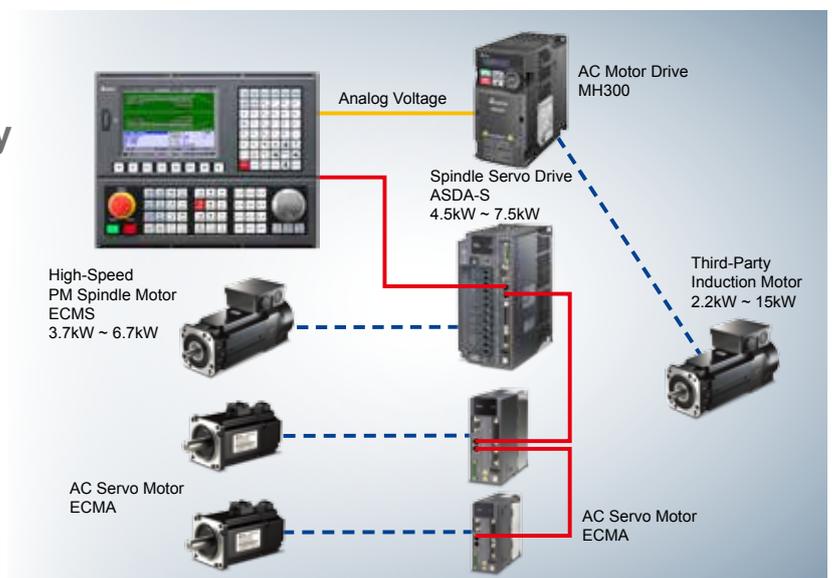
- XYZ 3 axes simultaneous control
- Single spindle, single turret applications
- Cost-efficient CNC controller
- Delta's DMCNET protocol
- Compatible with ISO standard G codes
- C-axis function (available March, 2017)

CNC Lathe Solution

System Application Flexibility

Solution 1:
DMCNET Communication with
Spindle Servo Drive

Solution 2:
Analog Signal with AC Motor Drive

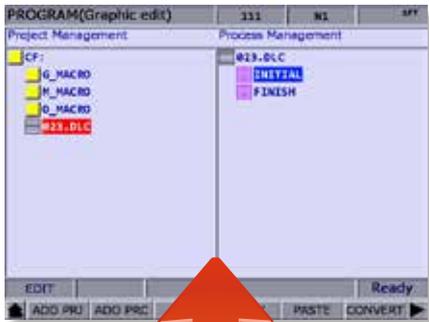


Lathe Functions

CNC Lathe Programming

Manage machining techniques with simple steps and quick programming.

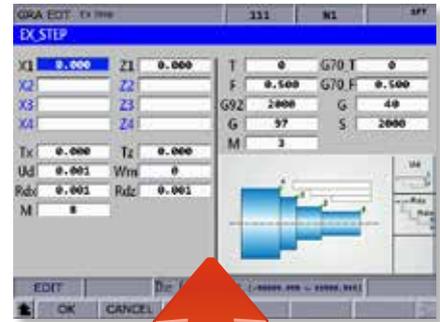
Graphical programming steps:



Step 1:
Click machining technique management function



Step 2:
Select techniques for machining

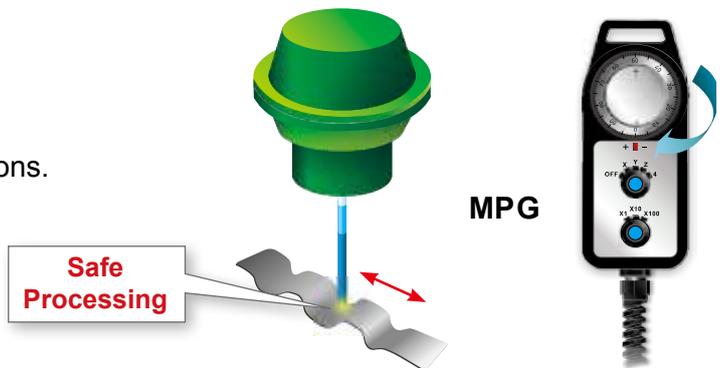


Step 3:
Fill in machining information

Step 4: Output complete NC code programming
Same workpiece can employ different machining technique combinations

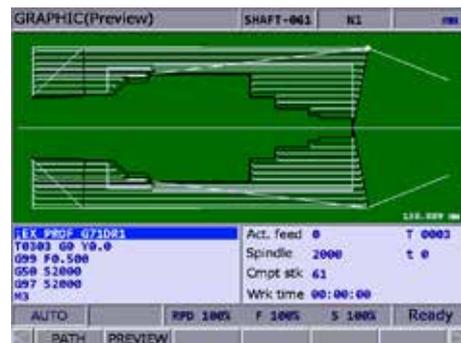
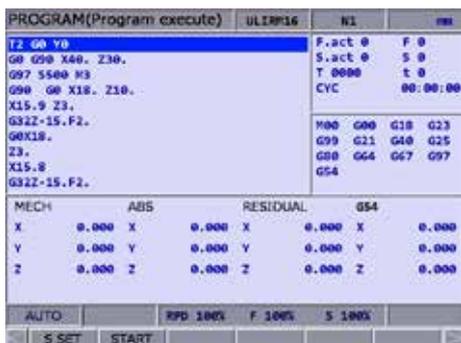
Manual Pulse Generator (MPG) Simulation

- Performs an exact simulation of the desired machining process under all operating conditions.
- Guarantees processing stability and prevents execution error or cutter/tool damage from inaccurate operation, making CNC processing safer and more accurate.



Graphical Preview of Tool Path (Look-Ahead Simulation)

- Provides graphical preview of tool paths to simulate, check and observe the movement of the tools to verify and optimize the NC machining programs before processing.
- If there are any problems found, this function allows users to adjust the programs until a satisfactory tool path is generated.



Lathe Functions

Tool Indexes Setup and Management

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	XWEAR	ZWEAR	RAD WEAR			
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

Record processing details for users to verify machining time and amount of work completed.

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

- Offers auto-gain tuning function and combines it with Delta's communication type AC servo system.
- The gain parameters can be automatically calculated, displayed on the screen and downloaded into servo drives, offering 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		

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			
P2-03	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	100			
P2-47	Auto Resonance Suppression Sel	1	1			
P2-23	Notch filter Freq(1)	1000	1000			
P2-34	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			

DIAGNOSE (Servo Tuning)		111	N1	SPT
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			

Servo Parameters Display
Servo parameter number and content

Positioning Points Setup
Positioning Point 1
Positioning Point 2

Tuning Criteria

Calculated Result Display
Calculated result and servo parameter values after auto-gain tuning

Default of Servo Drive
Current servo parameter values

Other Functions

Remote Monitoring & Data Synchronous Management

- Connecting an personal computer and an NC200 through an Ethernet communication network, the machining programs and parameters can be input and output, and managed remotely.
- Monitors and displays the machine operations from a remote location via communication and networking.
- Performs data transmission from an NC in machining process (Distributed Numerical Control, DNC).

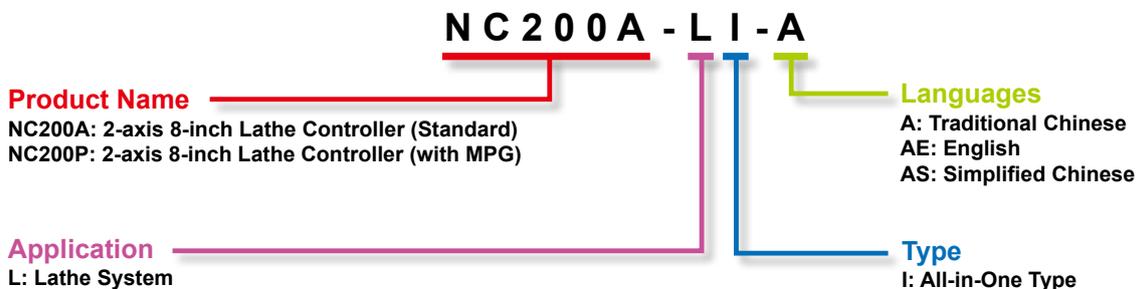
Barcode Application

- A barcode reader can be connected with an NC200 via USB to scan and input a huge amount of numerical values.
- Rapid uploading of parameters for machining can be achieved to significantly save data searching and processing time.

User Authority

- This function allows users to assign authority levels and register passwords to set permissions for different users for security control.
- User authority management includes: system, machine and user (operator), and three levels of authority to enhance operation safety.

Ordering Information



Electrical Specifications

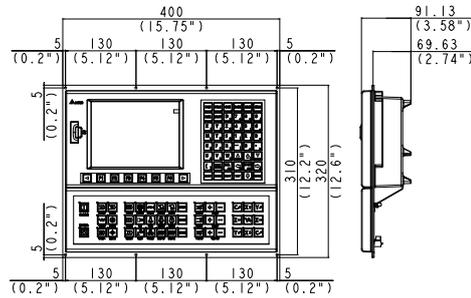
Models	NC200A-LI-A □	NC200P-LI-A □
Operation Environment	10% ~ 95% RH [0 ~ +55 °C]	
Storage Environment	Storage Environment 10% ~ 95% RH [-20 ~ +60 °C]	
Cooling Method	Natural Cooling	
Operation Voltage	DC +24V (-10% ~ +15%) (has built-in isolated power circuit)	
Voltage Endurance	AC500V for 1 minute (between charging (DC24V terminal) and FG terminals)	
Power Consumption	24V 0.6A 15W	
Backup Battery	3V lithium manganese battery CR2032x1	
Backup Battery Life	It depends on the temperature used and the condition of usage -- about 3 years or more at 25 °C	
Dimensions (W) x (H) x (D) mm	400 x 320 x 91	400 x 320 x 130
Weight (kg)	4.5	4.7

Standard Specifications

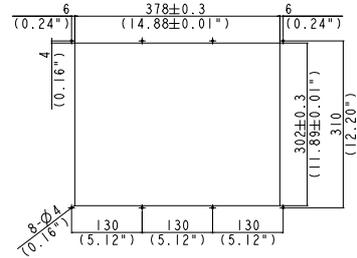
Model Name		DELTA NC200A/P
Product Specifications	Max. number of main systems	1
	Max. number of PLC control axes	1
	Max. number of NC controlled axes (standard)	3 (X, Y, Z)
	Max. number of spindle axes	1
	Max. number of simultaneous controlled axes	---
	Least control unit (mm)	0.0001
	Max. number of 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 color display LCD
	RJ-45	2 sets
	RS-485	1 set
	CF Card	1 set
Compensation	Backlash compensation	0
	Pitch error compensation	0
	Acute-angle compensation	0
Operation	MPG simulation	0
	Dry run	0
	Optional stop	0
	Single block execution	0
	Pause point start	0
	Breakpoint start	0 (breakpoint)
	External offset setting	0
Program Input	Optional skip	0
	Subroutine call	0 (M98)
	Acceleration / Deceleration constant of S-curve	0
	Automatic corner deceleration	0
	Circular radius speed limit	0
	Multiple groups of high-speed and high-precision parameters	0
Auxiliary Functions	Machine lock	0
	Software stroke limit	0
	Serial tuning function	0 (gain tuning function)
	Rapid spindle positioning	0 (M29)
	Data backup restore	0 (parameters import and export)
	Startup screen customization	0
	Authority management	0
Program Editing	Background editing	---
	Editing protection	0
Data Transfer	Ethernet (between PC and CNC side)	0
	DNC via Network	0
	DNC via USB	---
Data Display	Graphic simulation	0
G-code	G20 Outer diameter / inner diameter turning cycle	0
	G21 Thread turning cycle	0
	G24 Endface turning cycle	0
	G31 Skip function	0
	G33 Thread cutting	0
	G34 Variable pitch thread cutting	0
	G54 ~ G59 Workpiece coordinate system setting	0
	G72 ~ G78 Multiple cutting cycle	0
	G92.1 Absolute zero coordinate system setting	0 (G92)
	G96 Constant surface cutting speed	0

Dimensions

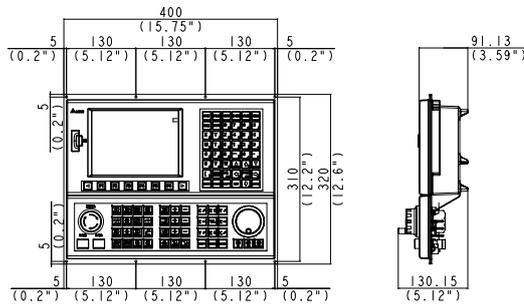
NC200A-LI-A □



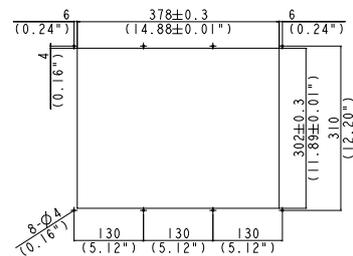
Cut-outs and Mounting Dimensions



NC200P-LI-A □



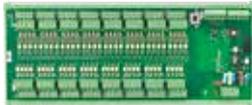
Cut-outs and Mounting Dimensions



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"> • 1.5/3.0/5.0/10M • 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: 286mm x 121.78mm x 51.01mm (Length x Width x Total Height) 	 <ul style="list-style-type: none"> • 32 Inputs / 16 Outputs • Part No.: NC-EIO-R3216 • Size: 286mm x 121.7mm x 54.73mm (Length x Width x Total Height) 	 <ul style="list-style-type: none"> • 20 Inputs / 10 Outputs • Part No.: NC-EIO-R2010 • Size: 217mm x 121.79mm x 60.56mm (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: 146.25mm x 86.78mm x 51.05mm (Length x Width x Total Height) 	 <ul style="list-style-type: none"> • Analog Output Type (4-channel DAC) • Part No.: NC-EIO-DAC04 • Size: 146.25mm x 86.78mm x 51.05mm (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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