

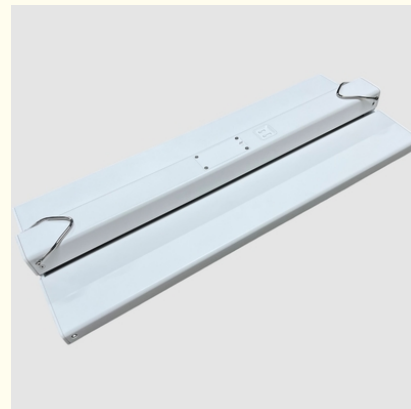


## 3 Axis CNC Milling for Intelligent ECU Prototype High Tolerance

### Our Product Introduction

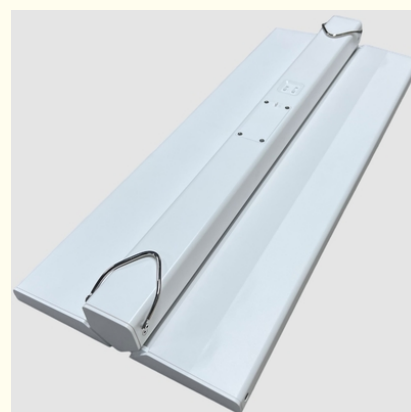
#### Basic Information

- Place of Origin: China Shenzhen
- Brand Name: Intelligent ECU Prototype
- Certification: Polishing, Anodizing, Painting, Chrome Plating, Silkscreen
- Model Number: ABS, PC, PMMA, POM, PA, PTFE, PEEK
- Minimum Order Quantity: 1 piece
- Price: USDD 30 piece
- Packaging Details: Carton, Plywood Box
- Delivery Time: 5 - 8 work days
- Payment Terms: T/T, Paypal
- Supply Ability: 1 piece per day



#### Product Specification

- User Interface: Intuitive And User-friendly Interface
- Function: Real-time Data Processing And Analysis
- Power Supply: Intelligent ECU Prototype
- Security Features: Advanced Security Measures
- Compatibility: Compatible With Various Vehicle Models
- Software Updates: Regular Software Updates
- Operating System: Customizable Operating System
- Processing Speed: High-speed Processing Capabilities
- Highlight: **intelligent ecu prototype high tolerance, 3 axis rapid prototype parts, 3 axis intelligent ecu prototype**



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## Product Description

### CNC Milling

CNC milling is a subtractive manufacturing process that utilizes 3-axis, 4-axis, or 5-axis milling machines to remove material from solid blocks of plastic or metal in order to create final parts with different geometries.

The number of axes refers to the directions in which the milling machine can move the cutting tool. A 3-axis CNC milling machine can move the cutting tool in the X, Y, and Z directions, while a 4-axis machine can also rotate the workpiece. A 5-axis CNC milling machine adds the capability to tilt and rotate the cutting tool, allowing for even more complex machining operations.



CNC milling machines use various cutting tools, such as end mills, drills, and reamers, to precisely remove material from the workpiece. The cutting tools rotate at high speeds and are guided by the CNC machine's computer-controlled movements based on the programmed instructions.

One of the significant advantages of CNC milling is the ability to achieve tight tolerances. Tolerance refers to the allowable deviation from the desired dimensions or specifications of a part. Tolerances are typically expressed in units of length, such as millimeters (mm) or micrometers ( $\mu\text{m}$ ). A tolerance of 0.01mm (or 10 micrometers) indicates that the finished milled parts will have a high level of accuracy and precision, with deviations within that specified range.



By utilizing 3-axis and 5-axis CNC milling services, you will have access to advanced milling capabilities that can accommodate complex part geometries and achieve tight tolerances. This opens up possibilities for creating intricate and precise custom parts for various applications. It's important to communicate your specific tolerance requirements and part specifications to the CNC milling service provider to ensure they can meet your needs.



CNC milling involves the cutting of solid plastic or metal materials to produce precision parts using various milling processes. Unlike CNC lathes that rotate the workpiece, CNC mills remove material by rotating and moving a cutting tool, typically a milling cutter, while positioning the workpiece appropriately to achieve the desired shape.

The advantage of CNC milling lies in its ability to create complex geometries and features with accuracy and repeatability. By utilizing multi-axis milling machines, such as 3-axis, 4-axis, and 5-axis machines, manufacturers can achieve greater flexibility in creating intricate shapes, channels, holes, curves, and corners. These machines allow for precise control over the cutting tool's movement in multiple directions, resulting in highly detailed and complex parts.



Additionally, CNC milling can be utilized in the production of tooling for other manufacturing processes, such as die casting and injection molding. By milling molds or dies, manufacturers can create high-quality tooling that enables the production of consistent and accurate parts in large quantities.

Overall, CNC milling provides a versatile and efficient method for manufacturing precision parts with complex geometries, making it an essential process in various industries.

#### CNC Machining Tolerances and Standards

With precision CNC machining services, Barana Rapid is your ideal partner to create precision machined prototypes and parts. Our standard CNC machining tolerances for metals is ISO 2768-f and for plastics is ISO 2768-m. We can also achieve special tolerances as long as you indicate your requirements for your drawing.

Standards	CNC Milling	CNC Turning
Maximum Part Size	2000x1500x600 mm	200x500 mm
Minimum Part Size	4x4 mm 0.1*0.4 in	2x2 mm 0.079x0.079 in
Minimum Feature Size	Φ 0. 50 mm Φ 0. 00197 in	Φ 0. 50 mm Φ 0. 00197 in
Standar Tolerances	Metals: ISO 2768-f Plastics: ISO 2768-m	Metals: ISO 2768-f Plastics: ISO 2768-m
Hole Diameters	+/- 0. 025 mm +/- 0. 001 in.	+/- 0. 025 mm +/- 0. 001 in.
Linear Dimension	+/- 0. 025 mm +/- 0. 001 in	+/- 0. 025 mm +/- 0. 001 in



Edge Condition	Sharp corner will be removed in the form of a chamfer or radius. The size of the chamfer, or resulting radii, must be indicated on the drawing.	
Shaft Diameters	+/- 0.025 mm +/- 0.001 in.	+/- 0.025 mm +/- 0.001 in.
Threads and Tapped Holes	Diameter: $\Phi$ 1.5-5 mm, depth: 3 $\times$ diameter Diameter: $\Phi$ 5 mm or more, depth: 4-6 $\times$ diameter	Diameter: $\Phi$ 1.5-5 mm, depth: 3 $\times$ diameter Diameter: $\Phi$ 5 mm or more, depth: 4-6 $\times$ diameter
Types of Thread	Barana Rapid can produce threads of any specification and size required by our customers.	
Text	Minimum width of 0.5 mm, depth of 0.1 mm	Barana Rapid can use laser marking to create standard text for CNC turned parts.
Lead Time	3 business days	3 business days






There are the number of axes on a CNC milling machine determines its capabilities and the complexity of parts it can produce. Higher-axis machines offer increased flexibility in creating intricate shapes and cutting angles, allowing for the production of complex parts.

Working with a reliable CNC milling company, such as Barana Rapid, can be beneficial for bringing your products to market efficiently. They offer a range of services, including rapid prototyping and custom production, utilizing premium 3-axis, 4-axis, and full 5-axis CNC milling machines. These machines enable high precision and high-quality production of CNC milled products.

By partnering with Barana Rapid, you can leverage their expertise and resources to transform your designs into complex geometries. Their experienced in-house machining team can help you achieve custom parts that meet your exact requirements.

With CNC milling services, you can have greater control over your projects and ensure the production of precise and tailored parts. Whether you need rapid prototyping or custom production, Barana Rapid's CNC milling services can assist you in turning your ideas into reality.

Materials for CNC Turning Parts			
Our CNC turning capabilities are suited for an extensive variety of materials, encompassing machine-grade metals and plastics. Tailored to your specific applications, we can produce accurate rapid prototypes and low-volume production runs using a selection of high-quality materials. Explore some of the frequently used materials for your CNC turning endeavors.			
	<b>ALuminum</b>  Aluminum is a highly ductile metal, making it easy to machining. The material has a good strength-to-weight ratio and is available in many types for a range of applications.		ALuminum
		Machinable Material Types	AL 6061, AL6063,AL6082,AL7075
		Lead Time	3 days
		Tolerances	$\pm 0.01$ mm
		Max part size	200 x 80 x 100 cm
	<b>Copper</b>  Copper displays excellent thermal conductivity, electrical conductivity and plasticity. It is also highly ductile, corrosion resistant and can be easily welded.		Copper
		Wall Thickness	0.75 mm
		Lead Time	3 days
		Tolerances	$\pm 0.01$ mm
		Max part size	200 x 80 x 100 cm
	<b>Brass</b>  Brass has desirable properties for a number of applications. It is low friction, has excellent electrical conductivity and		Brass
		Wall Thickness	0.75 mm
		Lead Time	3 days

	has a golden (brass) appearance.	Tolerances	±0.01mm
		Max part size	200 x 80 x 100 cm
	<b>Stainless Steel</b>  Stainless steel is the low carbon steel that offers many properties that are sought after for industrial applications. Stainless steel typically contains a minimum of 10% chromium by weight.		Stainless Steel
		Wall Thickness	0.75 mm
		Lead Time	3 days
		Tolerances	±0.01mm
		Max part size	200 x 80 x 100 cm
	<b>Titanium</b>  Titanium has a number of material properties that make it the ideal metal for demanding applications. These properties include excellent resistance to corrosion, chemicals and extreme temperatures. The metal also has an excellent strength-to-weight ratio.		Titanium
		Wall Thickness	0.75 mm
		Lead Time	3 days
		Tolerances	±0.01mm
		Max part size	200 x 80 x 100 cm
	<b>Plastics</b>  Plastics are also a very popular option for CNC machining because of its wide choices, relatively lower price, and significantly faster machining time needed. We provide all common plastics for CNC machining services.		Plastics
		Machinable Material Types	ABS,PC,PMMA,PTFE,PVDF,POM,PA
		Lead Time	3 days
		Tolerances	±0.01mm
		Max part size	200 x 80 x 100 cm
	<b>Magnesium</b>  Magnesium is a silver-white metal with a density of 1.74 g/cm <sup>3</sup> . Its characteristics are small density, good ductility, high strength, large elastic modulus, good heat dissipation, good shock absorption, greater impact load capacity than aluminum alloy, and good corrosion resistance to organic substances and alkalis.		Magnesium
		Wall Thickness	0.75 mm
		Lead Time	3 days
		Tolerances	±0.01mm
		Max part size	200 x 80 x 100 cm

Our company offers a comprehensive range of professional finishing services to enhance the appearance, performance, and durability of parts. Here are the major finishing services we provide:

**Anodizing:** Anodizing is an electrochemical process primarily used for aluminum parts. It creates a protective oxide layer on the surface, improving corrosion resistance and providing a decorative finish. Anodizing can also be combined with dyeing to add color options.

**Painting:** Our painting services allow for the application of various paint types to achieve desired colors, textures, or protective layers. Spray painting and powder coating are commonly used methods to enhance the appearance and surface qualities of parts.

**Pad and Silk Screen Printing:** Pad and silk screen printing techniques are employed to apply custom designs, logos, or labels onto parts. This service facilitates branding, product identification, or the addition of instructional information to enhance the visual appeal.

**Sanding and Polishing:** Our sanding and polishing services utilize abrasive materials to remove roughness and imperfections from surfaces, resulting in a smoother and more refined finish. This process enhances the appearance and feel of the parts.



**Vapor Polishing:** Vapor polishing is a technique used for plastic parts. It employs solvents or chemicals to melt the surface, eliminating imperfections and creating a glossy, transparent finish. Vapor polishing enhances the overall quality and visual appeal of plastic components.






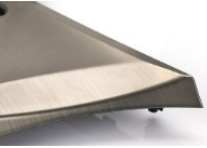
**Powder Coating:** Powder coating is a dry finishing process where a fine powder is electrostatically applied to the surface of the part. The coated part is then heated, allowing the powder to melt and form a durable and protective layer. Powder coating provides excellent resistance to corrosion, chemicals, and UV rays.

**Blasting:** Blasting involves directing high-velocity particles or beads onto the surface of parts. This process effectively removes imperfections, burrs, and sharp edges, resulting in a more uniform and matte finish. Blasting improves the overall surface quality and prepares the parts for subsequent treatments or applications.

By utilizing our full suite of finishing services, you can ensure that your parts not only meet functional specifications but also have an enhanced appearance, improved performance, and increased durability. Our skilled team will work with you to determine the most suitable finishing techniques for your specific requirements.

#### Surface Finishes for CNC Machining

CNC machining leaves visible tool marks during the process of removing portions of the block's surface to create desired shapes. If you don't want as-machined parts, select a surface finishing for your custom parts. At Barana Rapid, we offer several common surface finishes that help improve functionality and aesthetics.

	Name	Description	Materials	Color	Texture
	Anodizing	Anodizing improves corrosion resistance, enhancing wear resistance and hardness, and protecting the metal surface. Widely used in mechanical parts, aircraft, and automobile parts, precision instruments, etc.	Aluminum	Clear, black, grey, red, blue, gold.	Smooth, matte finish
	Sand Blasting	Sand blasting results in parts with a smooth surface with a matte texture. Used mainly for visual applications and can be followed by other surface treatments.	ABS, Aluminum, Brass	N/A	matte
	Powder Coating	Powder coating is a type of coating that is applied as a free-flowing, dry powder. Unlike conventional liquid paint which is delivered via an evaporating solvent, powder coating is typically applied electrostatically and then cured under heat or with ultraviolet light.	Aluminum, Stainless Steel, Steel	Black, any RAL code or Pantone number	Gloss or semi-gloss
	Electroplating	Electroplating can be functional, decorative or corrosion-related. Many industries use the process, including the automotive sector, in which chrome-plating of steel automobile parts is common.	Aluminum, steel, Stainless Steel	N/A	Smooth, Glossy finish
	Polishing	Polishing is the process of creating a smooth and shiny surface, either through physical rubbing of the part or by chemical interference. The process produces a surface with significant specular reflection, but in some materials is able to reduce diffuse reflection.	Aluminum, Brass, Stainless Steel, Steel	N/A	Glossy
	Brushing	Brushing is a surface treatment process in which abrasive belts are used to draw traces on the surface of a material, usually for aesthetic purposes.	ABS, Aluminum, Brass, Stainless Steel, Steel	N/A	Satin



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