VEICHI

Manual

RB100 Series Integrated Servo Wheel

Content

Version Change Log

Date	Version	Content
04/2025	V1.0	First version released

1 Overview

1.1 Safety Precautions

Please use this product only after the safety precautions described in this manual are fully understood to protect both persons and the products.

Signs and Meanings

The following signs are used in this manual to highlight the key safety points. Failure to observe these points may result in damages to this product and the associated system, or even personal injuries.

	DANGER: Incorrect operation may result in death or major safety incidents.
	CAUTION: Incorrect operation may result in minor injuries.

Please read and comply with all requirements in this manual, which will help you properly use and configure the integrated servo wheel to meet your application needs. Take note of each precaution below and follow them exactly; otherwise, malfunctions, product damage, or even dangerous situations may occur.

- Inspect the product's appearance and included accessories upon unpacking; if any defects or missing parts are found, do not install.
- Store or install the product in a well-ventilated, dry, dust-free environment free of cutting fluid, oil mist, iron powder, and metal shavings, and ensure no flammable materials are nearby to prevent foreign objects from entering the machine and causing malfunctions or electrical hazards.
- Use the original packaging for storage and transport, as it provides sufficient protection against common damage.
- Do not apply external force (e.g., dropping or striking) to the product during unpacking or installation.
- Do not use gasoline, thinners, acidic, or alkaline cleaning agents, as they may discolor the casing or corrode cables.
- Ensure the external power voltage matches the product's rated voltage, that all wiring connections are correct, and that there are no short circuits or loose connections in the peripheral circuitry; otherwise, the drive may be damaged.
- Confirm the input power is switched off before performing any wiring.
- Do not connect or disconnect communication cables while the power is on, as this may damage the product.
- Do not touch any rotating parts while the device is operating, as this may cause personal injury.
- The surface temperature may exceed 80°C during operation; beware of burns.
- Do not perform maintenance or servicing with the power on, as there is a risk of electric shock.

1.2 Operation

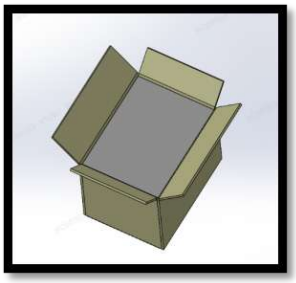
- Perform test operation with no load (not connected to the drive shaft) to prevent accidents; otherwise, injury may occur.
- Do not touch any rotating parts of the servo wheel while it is running to avoid injury.
- Set the user's parameters in advance to match the machines when starting operation, or it may cause control loss or failure of the product.
- Disable positive limit (P-OT) and negative limit (N-OT) signals under home mode.
- Do not touch the servo wheel body while power is on or has just been turned off to prevent burns.
- Only reset the errors after eliminating the causes and making sure it is safe to restart operation, or it may cause injury.
- Do not use the brake of the braking motor for common deceleration, as it may cause a malfunction.

1.3 Maintenance

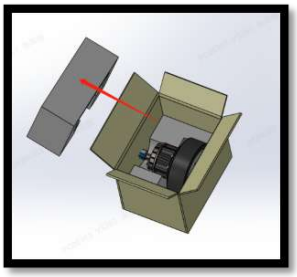
- Have a qualified operator perform power-on and power-off operations.
- Disconnect all circuits connected to the driver before performing insulation resistance tests to prevent driver malfunction.
- Do not use gasoline, thinners, alcohol, acidic, or alkaline detergents, as they may discolor or damage the casing.
- Do not change wiring while power is on to avoid electric shock.
- Do not disassemble the product to prevent electric shock or injury.

1.4 Unpacking Procedure

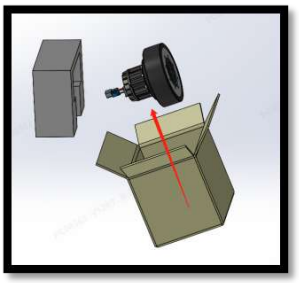
Step 1: Use a tool to cut open the sealing tape on the outer carton, as shown in the figure below.



Step 2: Remove the top foam insert from the carton in a vertical upward direction, as shown in the figure below.

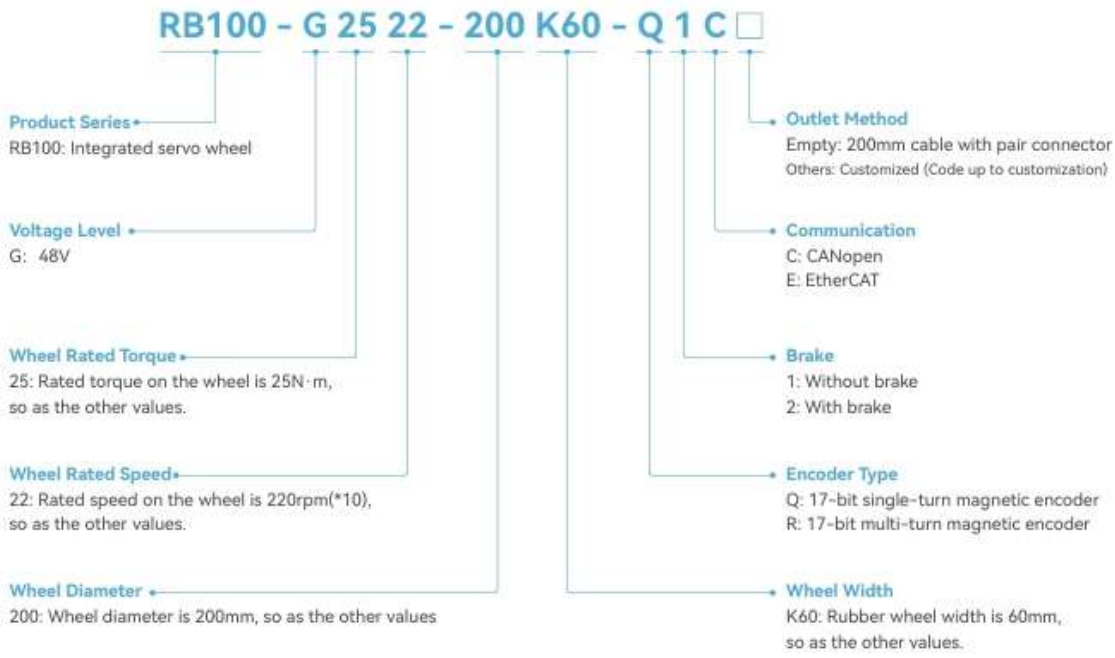


Step 3: Hold the integrated servo wheel unit with both hands and lift it out in a vertical upward direction, as shown in the figure below.



2 Product Description

2.1 Naming Rules



2.2 Model List

Refer to the RB100 Integrated Servo Wheel Catalog.

2.3 Cable Configuration

For cable selection, refer to the RB100 Integrated Servo Wheel Catalog. For detailed cable information, refer to the cable drawings.

2.4 Product Dimensions

Refer to the product specification.

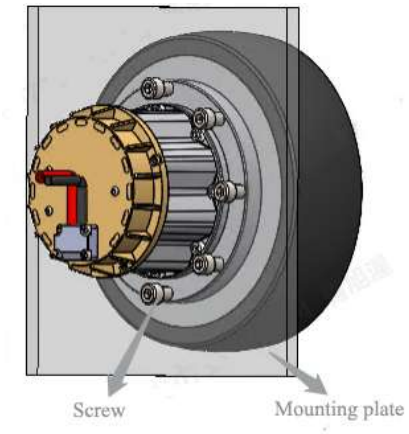
2.5 Product Features

Refer to the RB100 Integrated Servo Wheel Catalog.

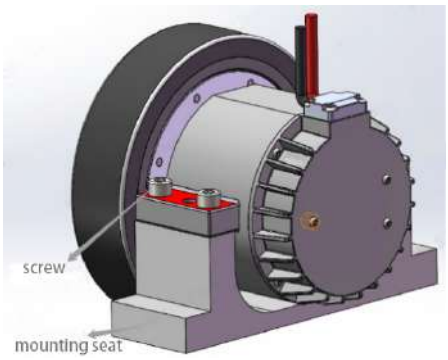
2.6 Installation Methods

The installation methods for different specifications in this product series are as follows:

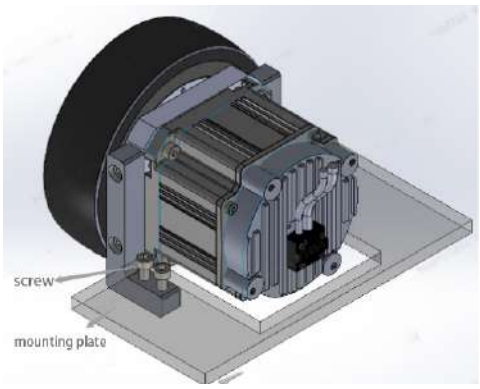
1. Flange Mounting



2. Cable Tray Mounting



3. Bracket Mounting



Note:

The mounting plate/mounting components are supplied by the customer. Dimensions and hole positions shall be implemented in accordance with the product design.

3 Debugging Guide

3.1 VCSDSoft_L Debugging Software

VCSDSoft_L is a host application for monitoring and debugging the RB100 driver on a PC.

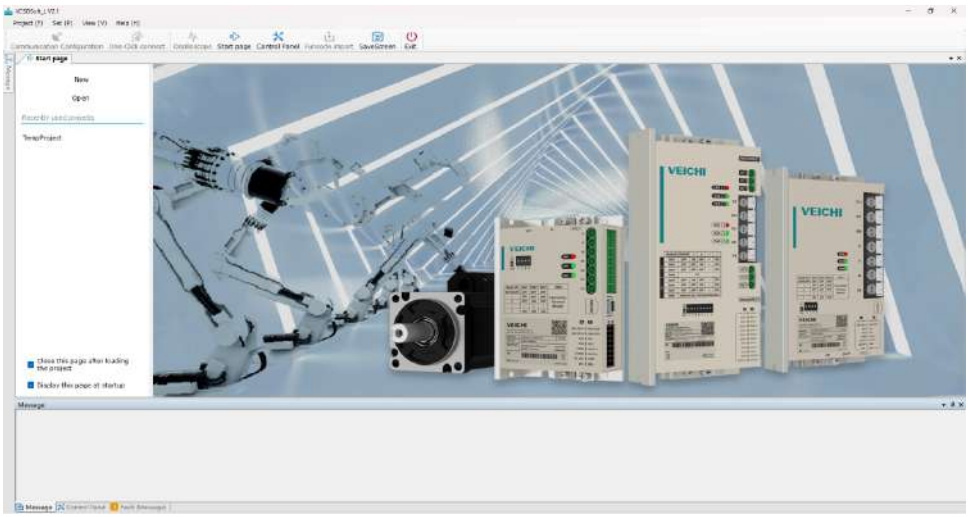


Figure 3-1 VCSDSoft_L Software Interface

Users connect the RB100 driver to the PC via a USB-to-RS485 cable. After installing VCSDSoft_L and its driver, users can configure and debug the RB100 driver's functions and performance. Figure 3-2 shows the physical connection diagram between the integrated wheel and the PC.

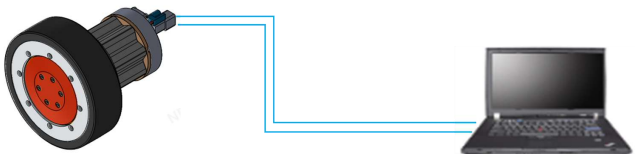


Figure 3-2 Physical Connection Diagram of Integrated Wheel and PC

Table 3-1 VCSDSoft_L Host Software Details

VCSDSoft_L	Details
Software Version	VCSDSoft_L Ver 2.1 Compatibility: SD100&RB100&RB200&RB300
Supported OS	Windows 7/Windows10/Windows11
Driver Path	 \VCSDSoft_L Ver2.1\driver
Communication Cable	USB to RS485

3.2 Basic Operation

3.2.1 Connection

Open the host debugging software and establish a connection via RS-485.

First, launch the software and click [Project] to create a new project. A temporary-project option is available; this manual uses a temporary project as an example. Create the project as shown in Figure 3-3.

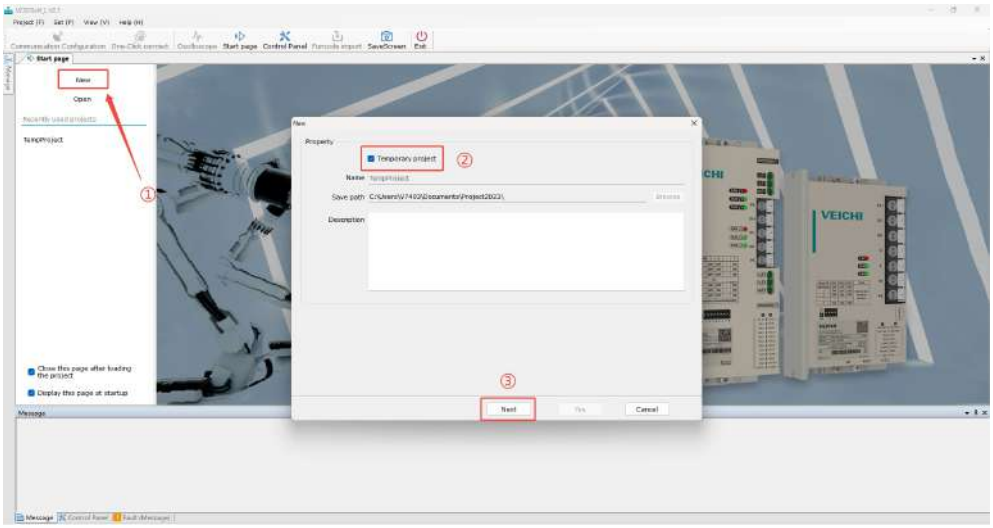


Figure 3-3 New Project

Next, set [Communication Method] to [RS485]. Click the [Refresh] button to rediscover the port number (can also verify it in the PC's Device Manager). Configure the communication parameters as follows (RS-485 factory default baud rate: 115200). Click [Online Search]—when the device is detected, communication is successful. Select the device and click [Sure] (Figure 3-4).

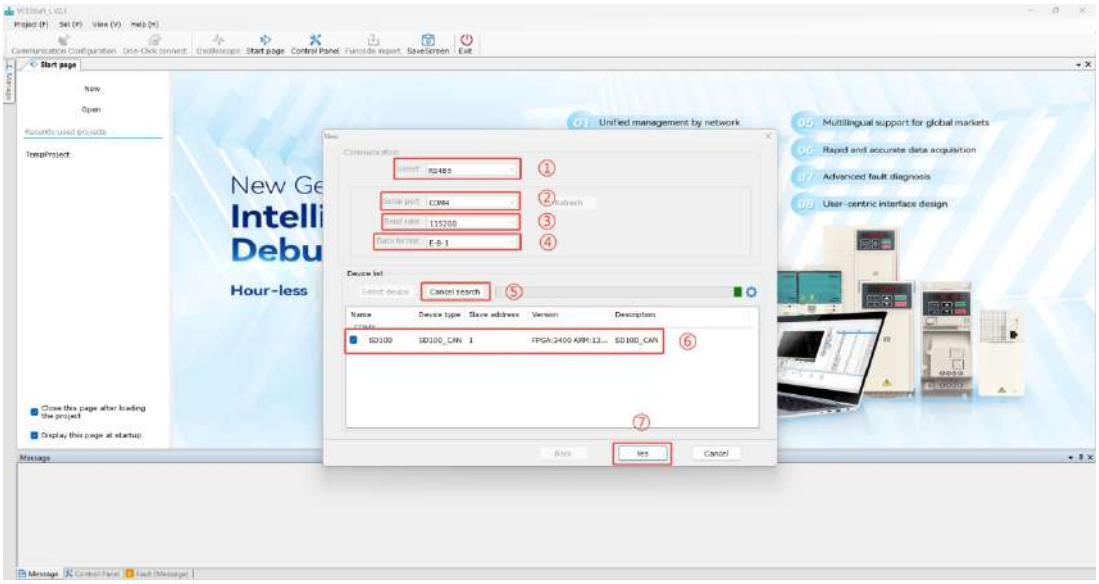


Figure 3-4 Communication Parameters Configuration

Once the project is created, the main VCSDSoft_L interface will appear, as shown in Figure 3-5.

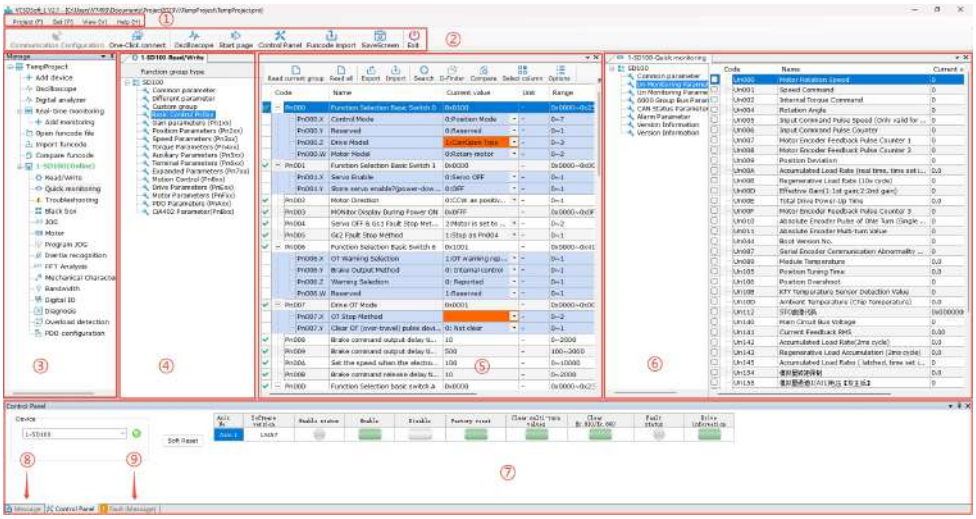


Figure 3-5 VCSDSoft_L Main Interface

- Navigation bar: Manages project file operations and project configuration information, and displays the bottom page layout view and Help information.
- Quick toolbar: Offers quick-access buttons for commonly used tools such as communication configuration, oscilloscope, control panel, and function code import.
- Project management area: Provides project management operations and entry points for controller-supported auxiliary functions, including read/write parameters, real-time monitoring, fault diagnosis, JOG, motor write, program JOG, inertia identification, FFT analysis, mechanical characteristics, bandwidth setting, digital I/O, diagnostic parameters, overload monitoring, and PDO configuration.
- Read/Write parameters: Displays a categorized list of parameters used to switch the content shown in the main function parameter interface.
- Main function parameter interface: Serves as the primary interface for reading and writing all Pn parameters, with support for batch data import, export, and comparison.

Note:

Areas ④ and ⑤ form a single interface, accessed by double-clicking Read/Write Parameters in area ③.

- Real-time monitoring interface: Displays real-time monitoring of various parameters. (Accessed by double-clicking [Real-time Monitoring] in area ③.)
- Control panel: Provides quick debugging functions for the servo controller, including enable, factory reset, and fault status.
- Message: Displays debugging messages output by the host.
- Fault notification: Displays fault information.

3.2.2 Read/Write Parameters and Real-time Monitoring

The Read/Write Parameters interface (see Figure 3-6) allows reading and writing of all Pn parameters and supports the following functions:

- Write: Select the target function code, enter the desired value, and press Enter to apply the change.
- Read: Click the 

to load all parameters in the current group or all groups.

- Import/export: Export the modified parameters of the current group to a ".param" file, which can be imported in batch later.
- Frequently Used Parameters: Add frequently used parameters for quick access and modification.
- Compare: Compare the current parameter set with the default settings or a previously saved ".param" file to identify any changes and facilitate analysis.

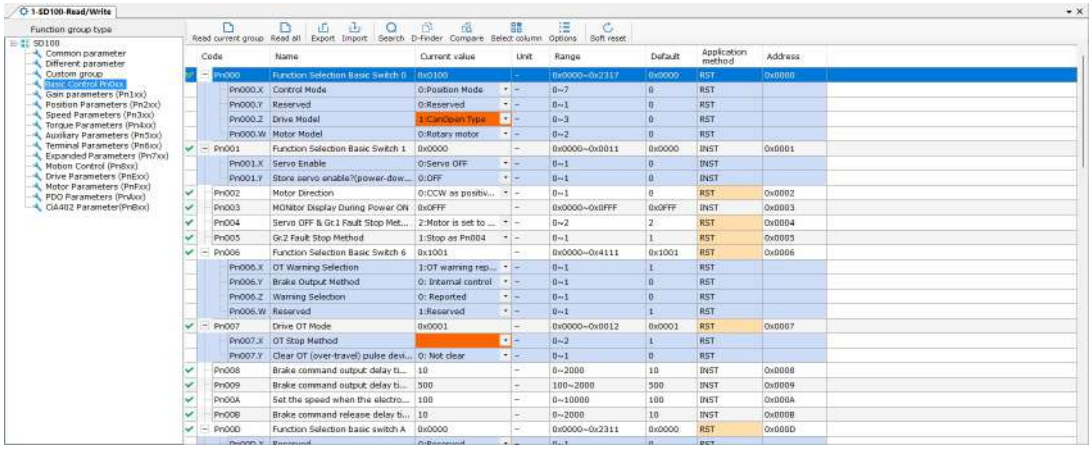


Figure 3-6 Read/Write Parameters Interface

- In the real-time monitoring interface (see Figure 3-7), all Un-group parameters and the 6000-group bus communication object dictionary parameters can be read in real time by selecting the checkbox to enable data acquisition. Right-click frequently used monitoring parameters to add them to the Frequently Used Parameters for continuous real-time reading, filtering out unnecessary parameters.

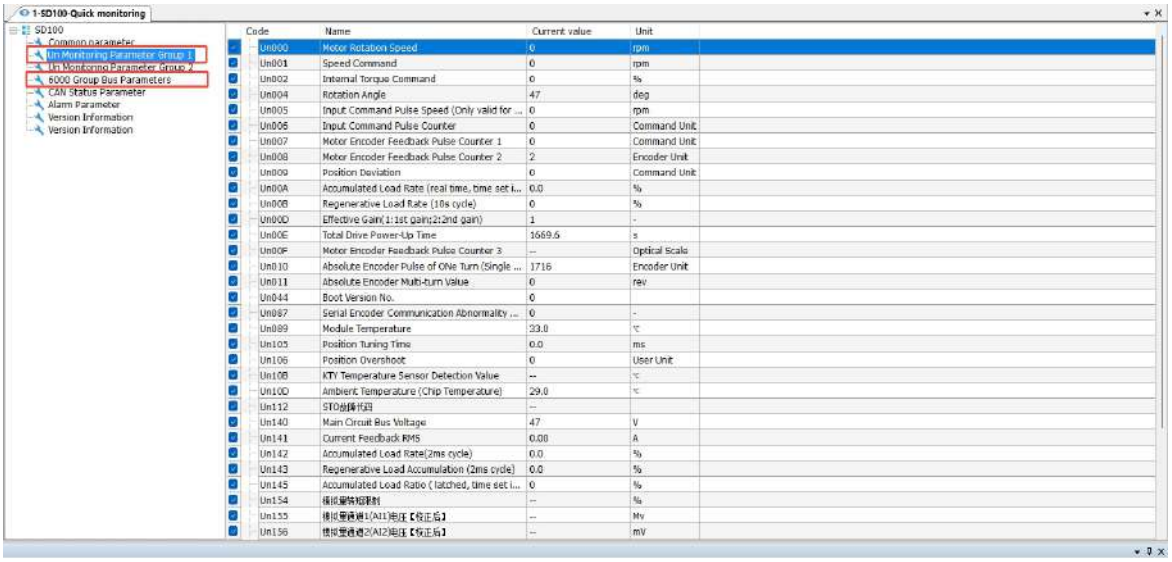


Figure 3-7 Real-time Monitoring Interface

3.3 Oscilloscope

A high-speed digital oscilloscope is integrated into the host software for data capture and waveform display, facilitating data analysis.

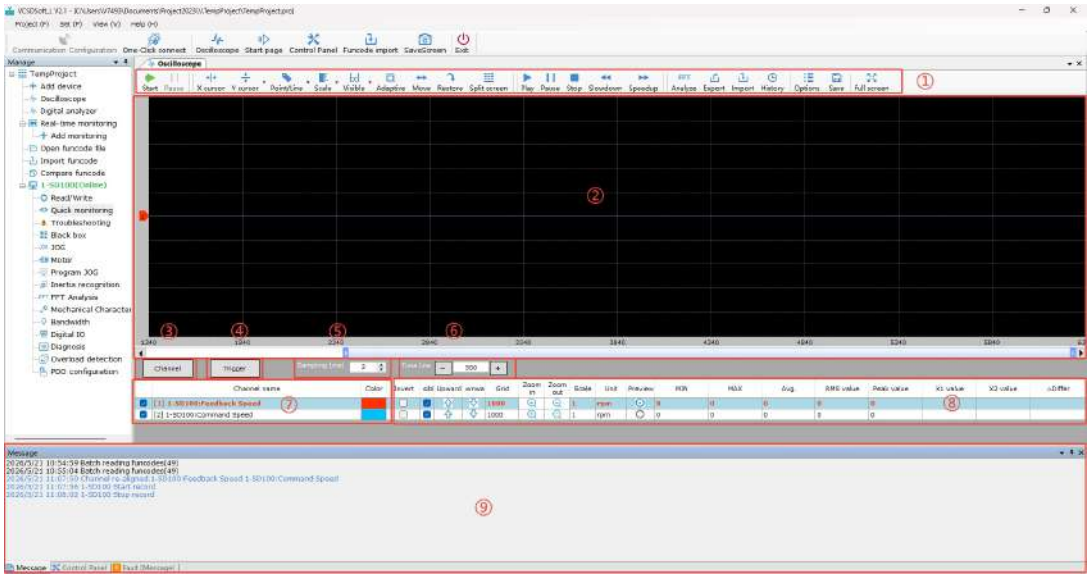


Figure 3-8 Oscilloscope Interface

- Toolbar: Includes Start, Pause, X/Y Cursors, Labels, Scale, Visible (show/hide curves), Adaptive, Move, Restore, Play, Pause, Stop, Decelerate, Accelerate, Export, Import, History, Options (oscilloscope settings), Save, and Full Screen.
- Waveform display area: Provides a visual waveform of each channel's data and serves as the main interface for toolbar operations.
- Channel & Trigger settings: Allows selection of channel parameters and configuration of trigger settings, including trigger mode and trigger conditions.
- Sampling cycle: Defines the sampling cycle in real-time recording mode (unit: ms). The minimum sampling cycle is 1ms in Real-Time Mode and 125μs in Trigger Mode.
- Time axis: Adjusts the horizontal time scale in the display area; increasing the time axis stretch shows more waveform cycles.
- Channel name: Shows the monitoring parameters for each channel added via channel setting.
- Channel details: Displays basic waveform information and the actual sampled values for each channel.
- Message print window: Prints output messages exchanged between the oscilloscope and the servo controller.

Precautions
The oscilloscope is unavailable when using auxiliary debugging functions.

3.4 CANopen Debugging Example

The RB100 series supports the CANopen communication protocol, allowing users to debug the RB100 driver via CANopen. In this section, a VC5-3232MAT-32 PLC is used as the master controller and an RB100 as the slave device to demonstrate Profile Position Mode control and outline the CANopen control process.

There are two primary methods for configuring the servo controller over CANopen: using SDO access or PDO communication.

3.4.1 Environment Setup and PDO Configuration

Step 1: Open the PLC programming software AutoStudio and create a new temporary project with PLC type VC5, as shown in Figure 3-9.

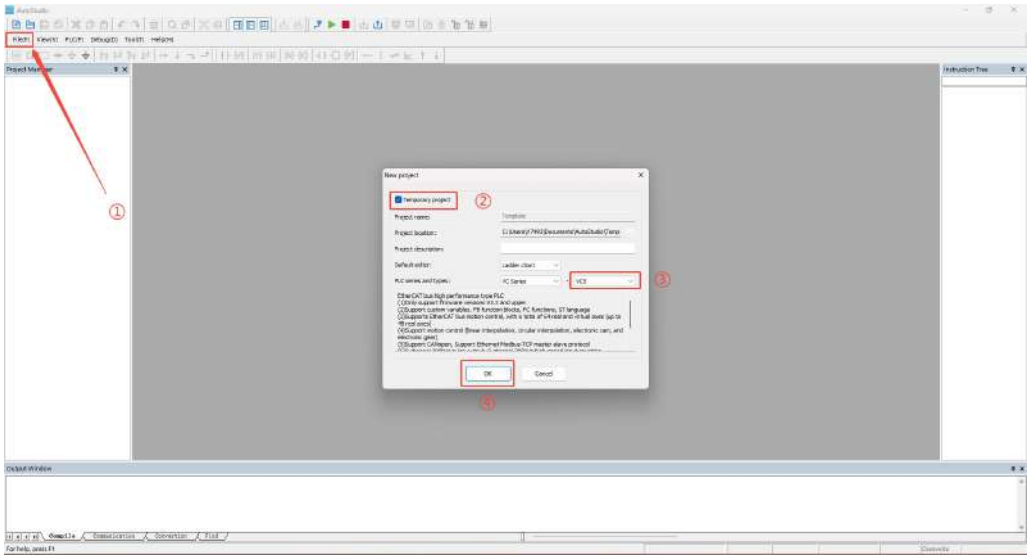


Figure 3-9 Create VC5 New Project

Step 2: In the Project Manager on the left, locate the Communication Configuration tab. Double-click “CAN” to open the CAN configuration window. Set Protocol Type to “Master,” enter the correct baud rate and station ID, and then click OK, as shown in Figure 3-10.

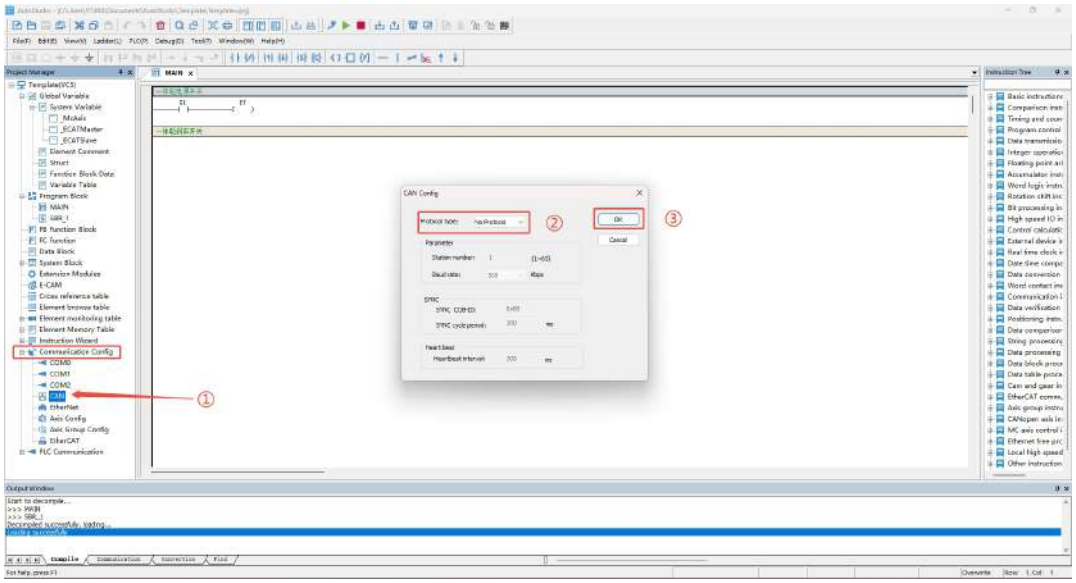


Figure 3-10 Configure CAN

Step 3: Right-click the “CAN” and select Add Configuration, as shown in Figure 3-11.

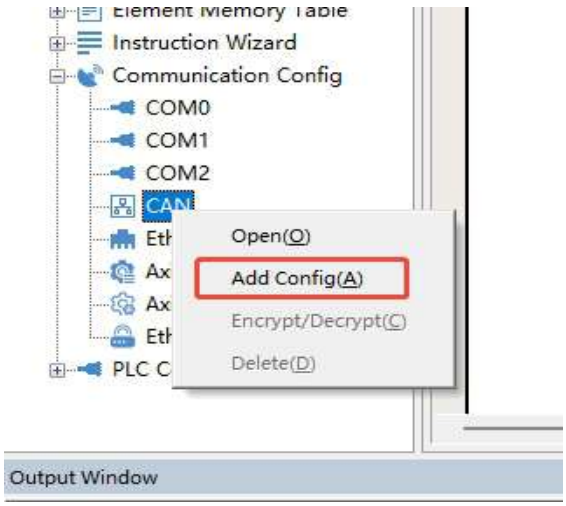


Figure 3-11 Add CAN Configuration

Step 4: Double-click the newly added CANopen configuration to open the CANopen setup interface, as shown in Figure 3-12.

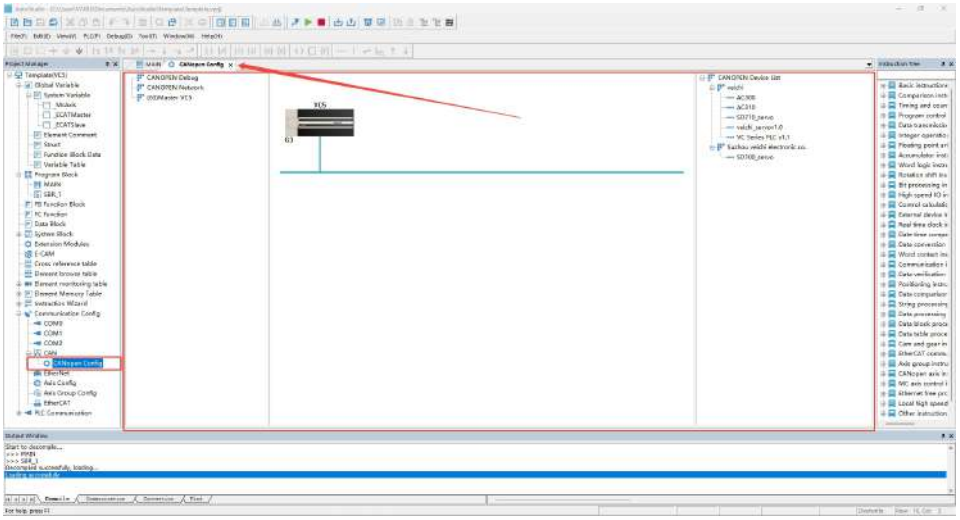


Figure 3-12 CANopen Configuration

Step 5: In the configuration interface, right-click the CANopen Device List on the right and click Import EDS. This imports the EDS file that matches the servo controller, as shown in Figure 3-13.

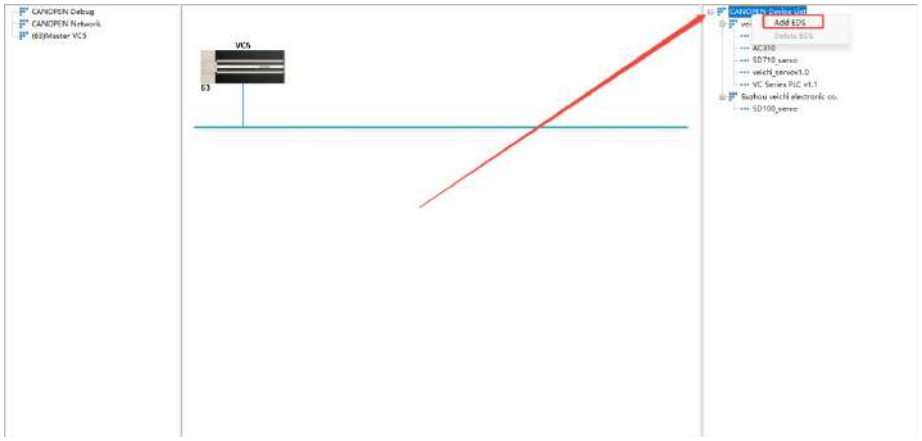


Figure 3-13 Import EDS File

Step 6: After importing the EDS file, a device entry with the same name as the controller appears in the list. Double-click it to add the controller to the bus deployment on the left, as shown in Figure 3-14.

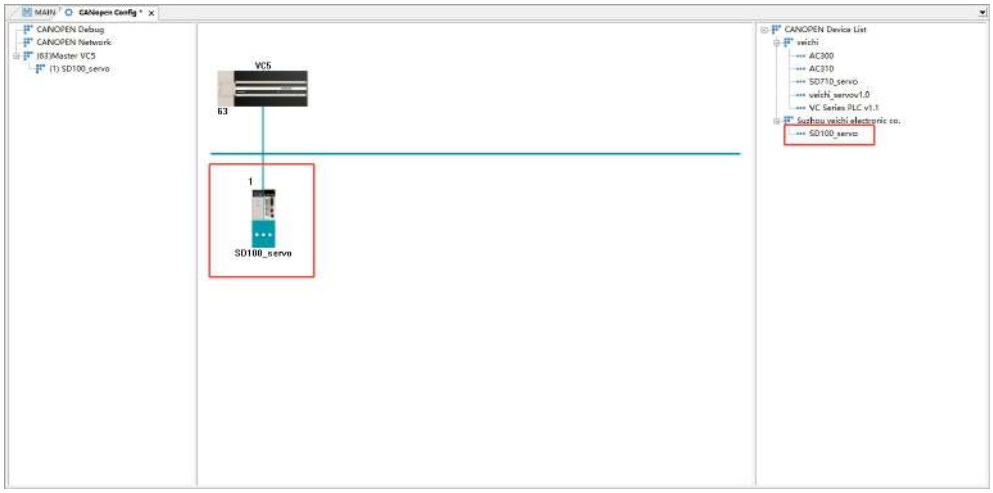


Figure 3-14 Add Controller to Bus Deployment

Step 7: Double-click the slave controller icon on the bus to open the slave configuration interface, as shown in Figure 3-15.

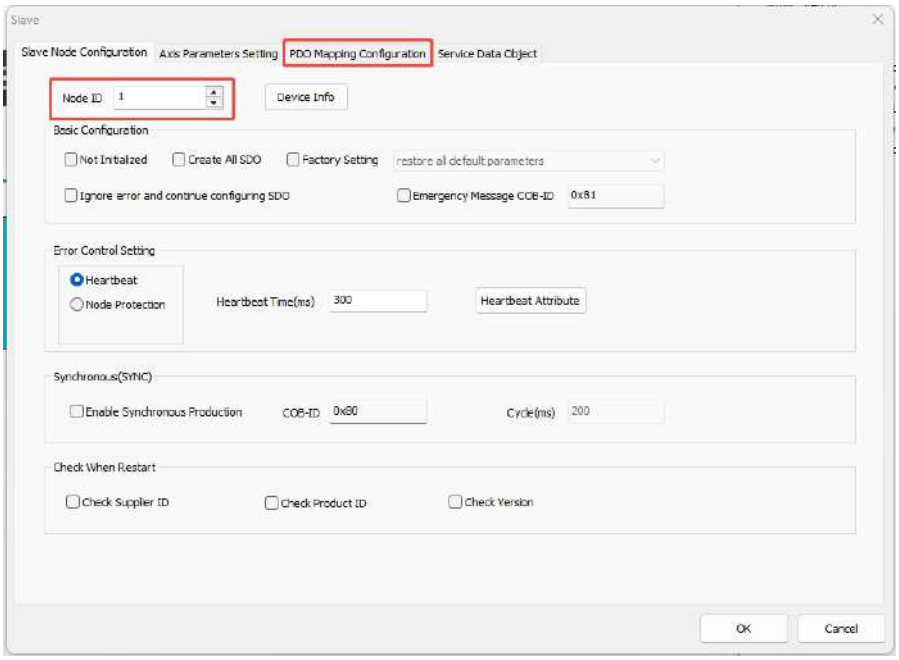


Figure 3-15 Slave Configuration

Step 8: With the slave node ID matching the target device, click the PDO Mapping and Configuration tab to open PDO settings. To configure RPDO2 mapped to object dictionary index 6060 (Control Mode), select PDO2 under RDO, click Add to open the object dictionary index list, find index 6060, select it, and click Add. This adds the PDO mapping at the appropriate location, as shown in Figure 3-16. To enable this PDO, check the box before it, as shown in Figure 3-17.

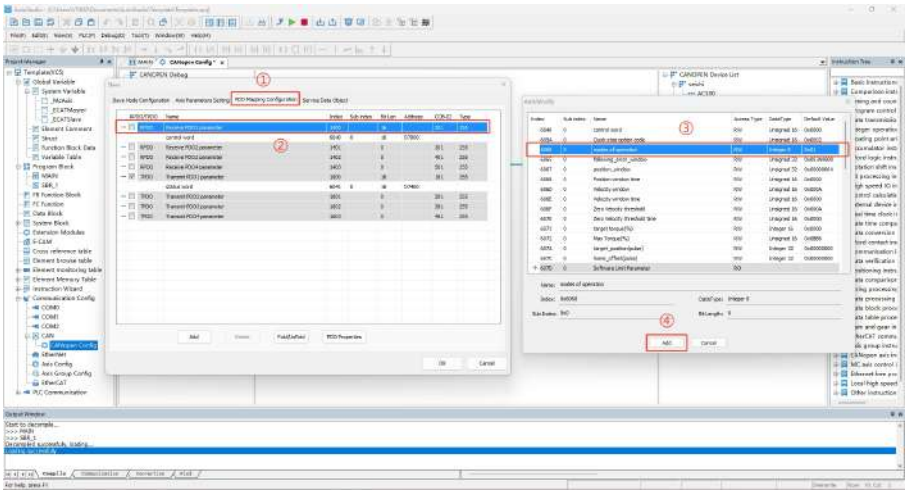


Figure 3-16 Configure PDO Mapping

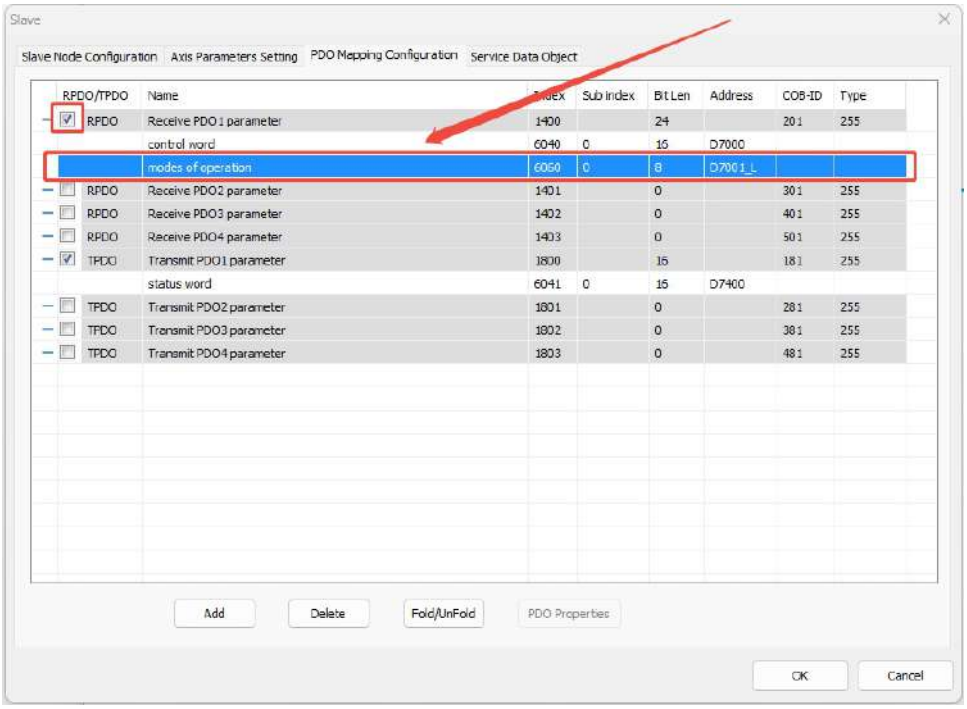


Figure 3-17 Check the PDO

Step 9: After adding the basic indexes needed for Profile Velocity Mode to the PDO mapping, note the corresponding address variables (highlighted in red in Figure 3-18). Click OK to exit the configuration interface. Each time you modify the PLC program, download it to the PLC and switch the PLC to Run mode.

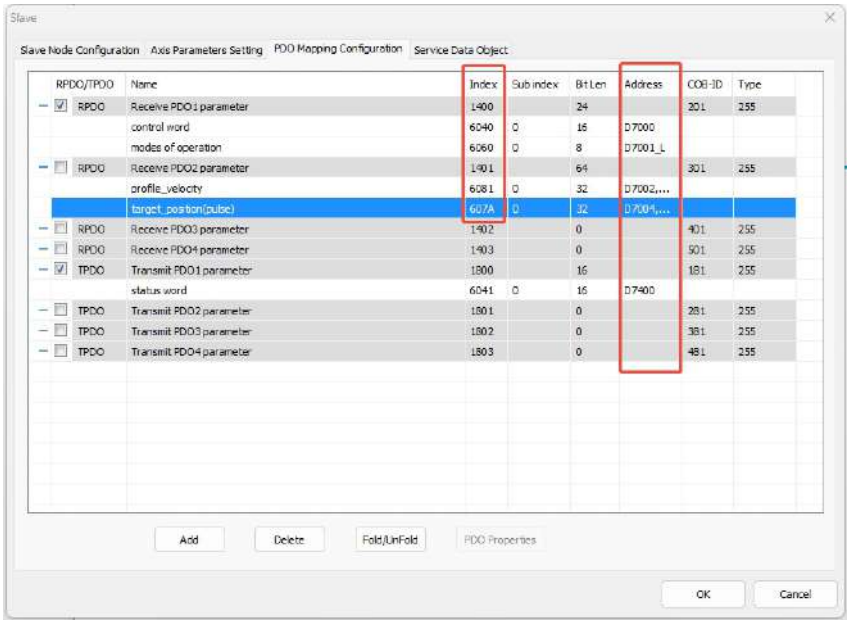


Figure 3-18 PDO Mapping

Step 10: Write the CANopen control program using the parameters listed in Table 3-2.

Table 3-2 Object Dictionary Parameter Writing

Item	Step	Parameter Input
Profile Position Parameter Assignment	0	607Ah=100000
	1	6081h=10000
Control Mode Switching	4	6060h=0x01
Servo Enable	5	6040h=0x06
	6	6040h=0x07
	7	6040h=0x0F
	8	6040h=0x1F

After enabling the servo, the motor moves at 60rpm until the user position feedback (6064) reaches 100000. Open the oscilloscope to observe the written object and feedback velocity waveforms, as shown in Figure 3-19.

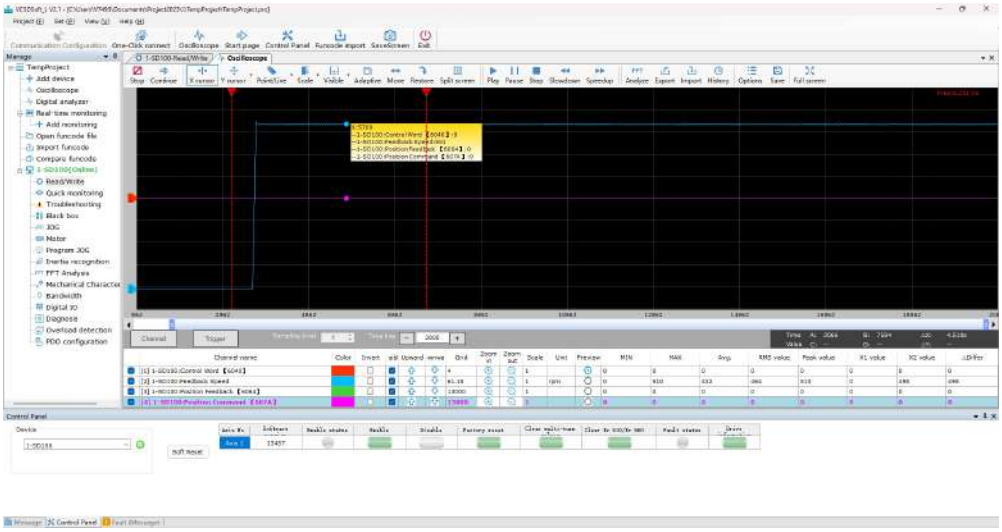


Figure 3-19 Oscilloscope Waveforms

3.4.2 SDO Read/Write

In CANopen communication, PDO mapping is implemented via SDO. SDO can also perform data exchange, though at lower efficiency. The following steps demonstrate Profile Position Mode configuration using SDO.

Step 1: In the CANopen configuration interface, click CANopen Debug to open the CANopen Debug window and start monitoring, as shown in Figure 3-20.

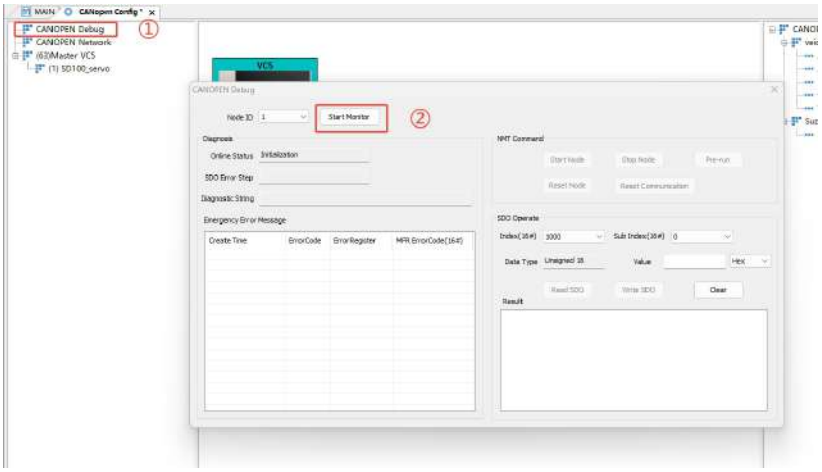


Figure 3-20 CANopen Debug Monitoring

Step 2: In the SDO Read/Write section, locate indexes 607A, 6081, 6060, and 6040. In the Data Value field, enter the values listed in Figure 3-21. (Note: Select the appropriate data type from the dropdown based on the value entered.)

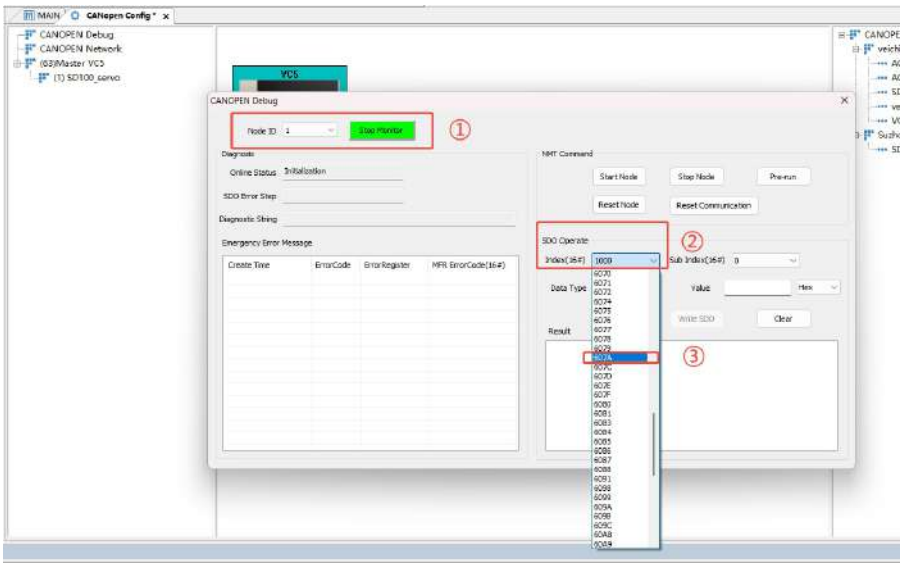


Figure 3-21 SDO Read/Write Object Dictionary

Step 3: Use Write SDO and Read SDO to access each index, as shown in Figure 3-22. After writing the parameters per Figure 3-22, the motor will move in Profile Position Mode.

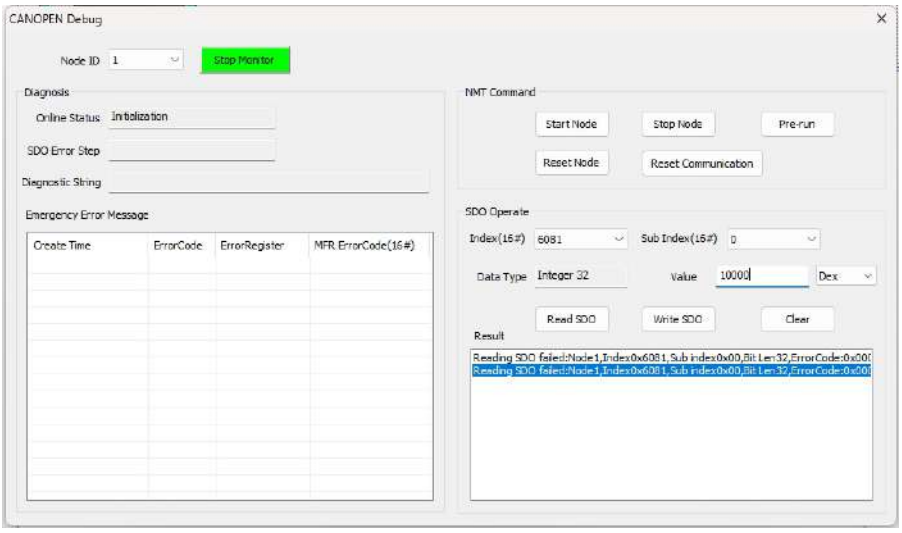


Figure 3-22 SDO Read/Write Interface

For object dictionary parameters required by other control modes, refer to the motion-mode descriptions in the Communication chapters.

4 Parameter Description

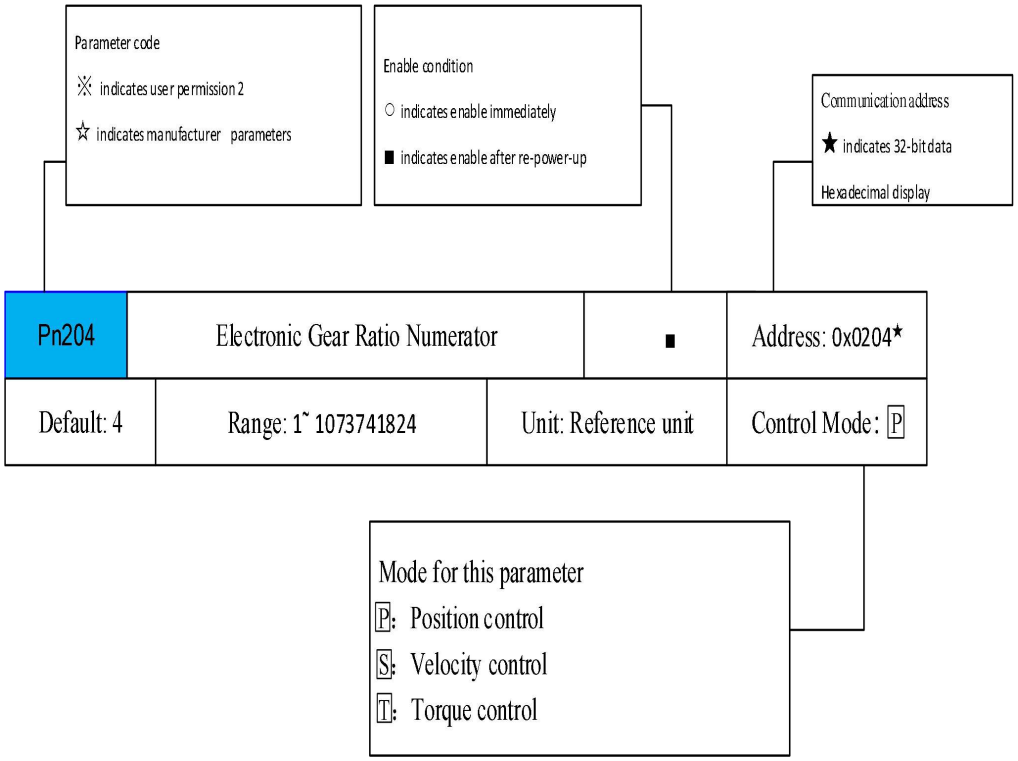
4.1 Parameter Classification

The RB100 drive includes 11 groups of Pn setting parameters and one group of Un monitoring parameters. All parameter are categorized as follows:

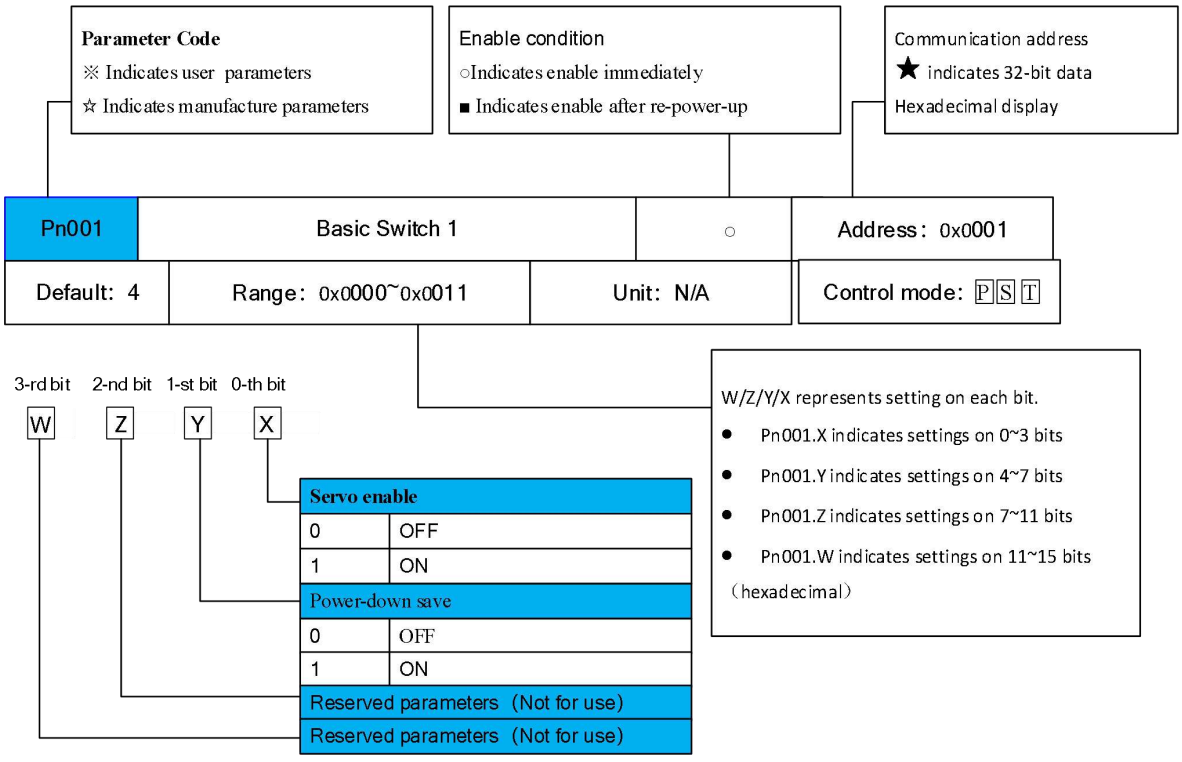
Parameter Group	Function
Pn0xx	Basic Parameters: Settings for control mode, brake control, encoder reset, and communication.
Pn1xx	Gain Parameters: Settings for basic speed/position loop/ASR gains and advanced tuning functions such as auto-tuning, no-tuning, A-type vibration suppression, notch filtering, friction compensation, speed observer, and disturbance observer.
Pn2xx	Position Parameters: Basic configuration for position command selection, electronic gearing, backlash compensation, origin return, and position control output, plus low-frequency suppression and model-following control.
Pn3xx	Speed Parameters: Internal speed setting, acceleration/deceleration settings, zero-speed clamp, and speed control output.
Pn4xx	Torque Parameters: Internal torque setting, torque filtering, and speed limiting.
Pn5xx	Auxiliary Parameters: JOG settings
Pn6xx	Terminal Parameters: Configuration of digital input/output functions and polarities; supports virtual I/O
Pn7xx	Extended Parameters
Pn8xx	Motion Control Parameters: Pr internal position parameters
PnExx	Driver Parameters: Internal parameters; modification not recommended
PnFxx	Motor Parameters: Internal parameters; modification not recommended
Unxxx	Monitoring Parameters

4.2 Pn Parameter Format

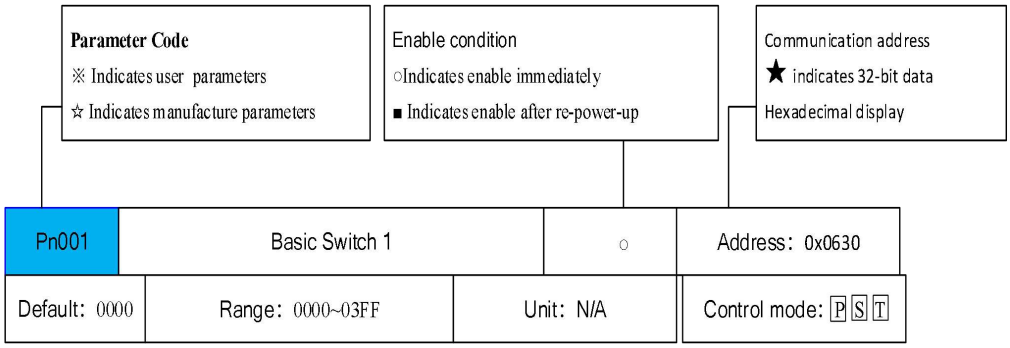
4.2.1 "Value Setting" Parameters Format

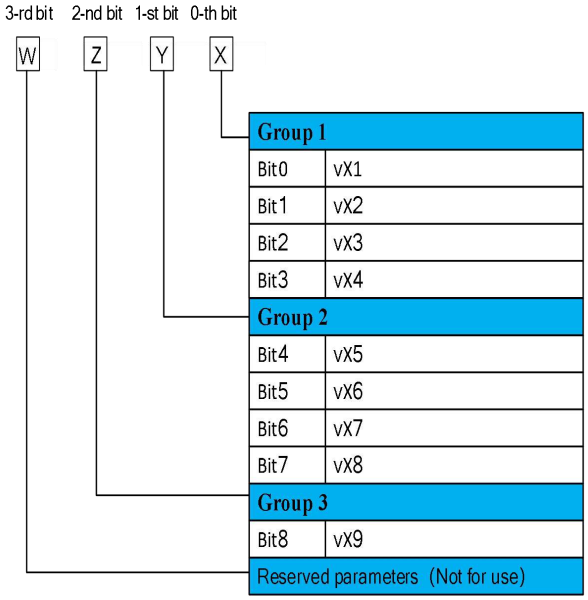


4.2.2 "Function Selection" Parameters Format



4.2.3 Switching Parameters Format





4.3 Pn Parameter Overview

4.3.1 Basic Parameter (Pn0xx)

<table>
<tr><td>Pn000</td><td colspan="2">Function Selection Switch 0</td><td>■</td><td>Address: 0x0000</td></tr>
<tr><td colspan="2">Default: 0x0000</td><td>Range: 0x0000~0x2217</td><td>Unit: N/A</td><td>Control mode: Ⓟ Ⓢ Ⓣ</td></tr>
<tr><td rowspan="20">Setting</td><td rowspan="9">0-th bit
X</td><td colspan="3">Control mode</td></tr>
<tr><td>0</td><td colspan="2">Position control</td></tr>
<tr><td>1</td><td colspan="2">Speed control</td></tr>
<tr><td>2</td><td colspan="2">Torque control</td></tr>
<tr><td>3</td><td colspan="2">Speed ↔ Position control</td></tr>
<tr><td>4</td><td colspan="2">Torque ↔ Position control</td></tr>
<tr><td>5</td><td colspan="2">Speed ↔ Torque control</td></tr>
<tr><td>6</td><td colspan="2">Speed ↔ Position ↔ Torque control</td></tr>
<tr><td>7</td><td colspan="2">Reserved (Do not use)</td></tr>
<tr><td>1-st bit
Y</td><td colspan="3">Reserved parameter (Do not use)</td></tr>
<tr><td rowspan="4">2-nd bit
Z</td><td colspan="3">Driver model</td></tr>
<tr><td>0</td><td colspan="2">Standard pulse type</td></tr>
<tr><td>1</td><td colspan="2">CANopen type</td></tr>
<tr><td>2</td><td colspan="2">EtherCAT type</td></tr>
<tr><td rowspan="4">3-rd bit
W</td><td colspan="3">Motor type</td></tr>
<tr><td>0</td><td colspan="2">Rotary motor</td></tr>
<tr><td>1</td><td colspan="2">Linear motor</td></tr>
<tr><td>2</td><td colspan="2">Virtual motor</td></tr>
<tr><td>Description</td><td colspan="4">Control mode: Used to set the command signal source of the drive. For position mode, select the command source via function code Pn200; for velocity mode, via Pn300; for torque mode, via Pn400.</td></tr>
</table>

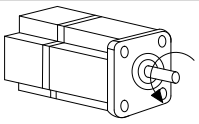
Pn001	Function Selection Switch 1	○	Address: 0x0001
Default: 0x0000	Range: 0x0000~0x0011	Unit: N/A	Control mode: P S T

Setting	0-th bit X	Servo enable	
		0	OFF
		1	ON
	1-st bit Y	Power-down save	
		0	OFF
		1	ON
	2-nd bit Z	Reserved parameter (Do not use)	
	3-rd bit W	Reserved parameter (Do not use)	

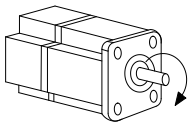
Pn002	Motor Direction	■	Address: 0x0002
Default: 0x0000	Range: 0x0000~0x0001	Unit: N/A	Control mode: P S T

Used to configure the operating method for a battery-backed absolute encoder.

Setpoint	Description	Comment
0	CCW as the positive rotation direction (counterclockwise)	-
1	CW as the positive rotation direction (clockwise)	-



Facing the coated wheel, motor rotates counterclockwise (CCW)



Facing the coated wheel, motor rotates clockwise (CW)

Pn004	Stop Mode for Servo OFF/Gr.1 Alarm	■	Address: 0x0004
Default: 0x0002	Range: 0x0000~0x0002	Unit: N/A	Control mode: P S T

Used to set the drive's stop mode when it is OFF or when a Class 1 fault alarm occurs.

Setpoint	Description	Comment
2	Free stop	[Default]

Pn005	Stop Mode for Gr.2 Alarm	■	Address: 0x0005
Default: 0x0000	Range: 0x0000~0x0001	Unit: N/A	Control mode: P S T

Used to set the drive's stop mode when a Class 2 fault alarm occurs.

Setpoint	Description	Comment
0	Zero-speed stop	-
1	The same as Pn004	Up to model

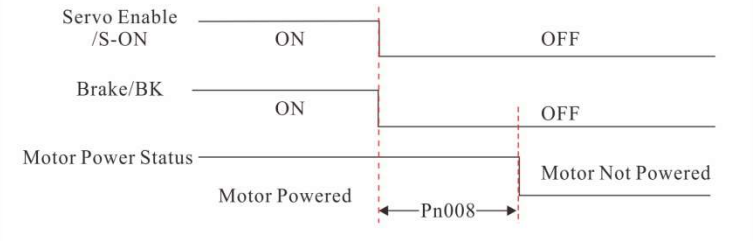
Pn006	Function Selection Switch 6	■	Address: 0x0006
Default: 0x1001	Range: 0x0000~0x4121	Unit: N/A	Control mode: P S T

Setting			
	0-th bit X	Over-travel (OT) alarm detection	
		0	OFF
		1	ON
	1-st bit Y	Reserved parameter (Do not change)	
	2-nd bit Z	Alarm enable	
		0	ON
		1	OFF (A.971 excluded)
	3-rd bit W	Cooling fan control (for drivers with fan)	
		0	When servo is ON, fan runs if temperature >45°C and stops if <42°C.
		1	When servo is ON, fan runs immediately. When servo is OFF, fan runs if temperature >45°C and stops if <42°C.
		2	When servo is ON, fan runs immediately. When servo is OFF, fan stops immediately.
		3	Forced off
		4	Forced on

Pn007	Over-travel (OT) Stop Mode	■	Address: 0x0007
Default: 0x0001	Range: 0x0000~0x0012	Unit: N/A	Control mode: P S T

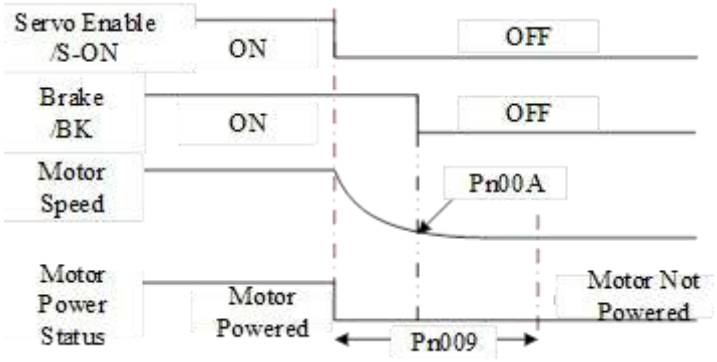
Setting	0-th bit X	Over-travel (OT) alarm detection	
		0	DB stop or free stop (the same as Pn004)
		1	Use Pn053 as maximum torque to stop the motor and enter servo lock
		2	Use Pn053 as maximum torque to stop the motor and enter free stop
	1-st bit Y	Pulse deviation clearing on over-travel (OT)	
		0	OFF
		1	Clear when positive limit (POT) or negative limit (NOT) is inhibited
	2-nd bit Z	Reserved parameter (Do not change)	
	3-rd bit W	Reserved parameter (Do not change)	

Caution	
	● For vertical axes, after overtravel, the brake signal (/BK) turns ON (brake released), and the workpiece may fall. To prevent this, set to make the servo motor fixed at the zero position after stopping (Pn007=1)"; ● Under external force, after overtravel, the motor enters a base-lock state when stopped, and the load shaft may be pushed back. To prevent this, set to make the servo motor fixed at the zero position after stopping (Pn007=1)";

Pn008	Brake Command – Motor Output Delay when Servo OFF	○	Address: 0x0008
Default: 10	Range: 0~2000	Unit: ms	Control mode: Ⓟ Ⓢ Ⓣ
Description	● When the servo motor stops, the brake(/BK) and servo ON(/S-ON) signal are OFF at the same time. This parameter determines the delay from the moment the servo ON (/S-ON) signal is deactivated to when the motor actually becomes de-energized. ● On a vertical axis, the weight of the moving components or external forces may cause slight motion; by extending the energized state after the brake engages, this delay eliminates minor movement.  Note: In the event of an alarm, this delay does not apply. The servo motor immediately de-energizes, so the machine may move before the brake engages due to component weight or external forces.		

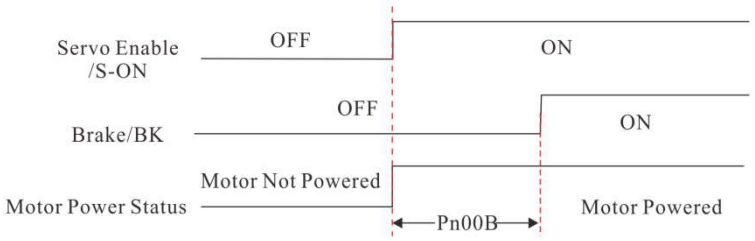
Pn009	Servo OFF – Brake Command Waiting Time	○	Address: 0x0009
Default: 500	Range: 100~2000	Unit: ms	Control mode: Ⓟ Ⓢ Ⓣ

Pn00A	Motor Speed Upon Brake Release	○	Address: 0x000A
Default: 100	Range: 0~10000	Unit: rpm	Control mode: Ⓟ Ⓢ Ⓣ
Description	When an error occurs during the the servo motor operation, the servo motor stops and the brake signal(/BK) is OFF. In this case, the actual brake(/BK) OFF time can be adjusted by setting /BK OFF Velocity and Servo OFF /BK OFF Delay Time. When any of the following conditions is met, the brake will engage: ● After the motor loses power, the motor speed is lower than the /BK ON speed level. ● After the motor loses power, it passes the Servo OFF /BK OFF Delay Time setting.		



Caution
● When an alarm occurs, the motor is stopped to zero speed: After issuing the zero-speed command to stop the motor, the system uses function code Pn007 to output the brake signal (/BK). ● Even if Pn009 is set to a value exceeding the maximum speed of the servo motor in use, it will be limited to the servo motor's maximum speed.

Pn00B	Brake Command – Servo-On Brake Release Delay	○	Address: 0x000B
Default: 10	Range: 0~2000	Unit: ms	Control mode: Ⓟ Ⓢ Ⓣ
Description	● When the servo motor starts, users can set the brake-release delay time (Pn00B) to control the interval from receiving the ON signal until the motor is actually powered. ● For vertical axes, the moving parts' weight or external forces may cause slight movement; by setting this function code, the brake releases after the motor is enabled.		



Caution	
	For single-tube circuits, when Pn00B=0, after the servo enable signal (/S-ON) turns ON, the brake output signal (/BK) releases after approximately 20ms.

Pn00D	Function Selection Switch D	■	Address: 0x000D
Default: 0x0000	Range: 0x0000~0x2111	Unit: N/A	Control mode: P S T

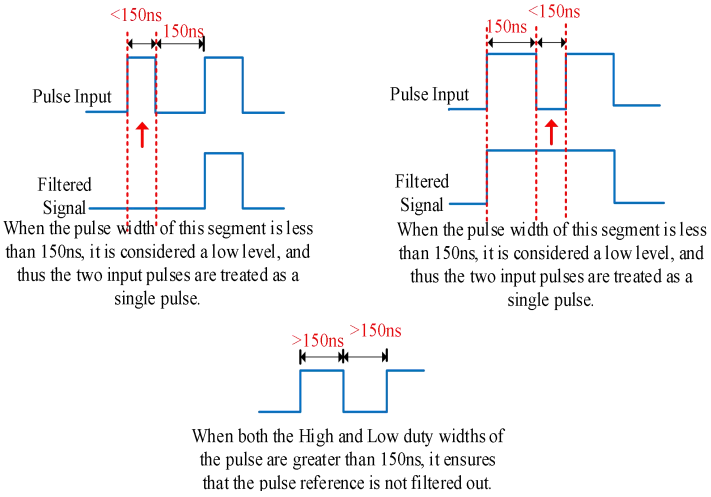
Setting	0-th bit X	-	
	1-st bit Y	-	
	2-nd bit Z	Speed detection mode	
		0	Mode 0
		1	Mode 1
		2	Mode 2
		3	Mode 3
	3-rd bit W	Absolute position limit switch (soft limit switch)	
		0	OFF
		1	ON, set via function codes Pn030 and Pn032
		2	ON, set via object dictionary [607Dh]

Caution	
	● The absolute-position soft limit switch can only be enabled when both of the following are true: ① The motor encoder is an absolute encoder (PnF00.W = 1); ② The absolute encoder is normal (Pn040[Absolute Encoder Usage]=0) ● Regardless of whether the absolute-position limit switch is enabled, the external input terminal limit switch remains effective (if configured).

Pn00E	Function Selection Switch E	■	Address: 0x000E
Default: 0x4000	Range: 0x0000~0x4111	Unit: N/A	Control mode: P S T

Setting	0-th bit X	Absolute encoder multi-turn overflow (ER.C21)	
		0	Displayed
		1	Not displayed
	1-st bit Y	Drive and motor voltage matching detection switch	
		0	ON
		1	OFF
	2-nd bit Z	Virtual motor encoder type	
		0	Incremental encoder
		1	Absolute encoder
	3-rd bit W	Virtual motor encoder bit count	
		0	16-bit
		1	17-bit
		2	20-bit
		3	23-bit
		4	24-bit

Caution	
	● The absolute encoder multi-turn overflow detection is enabled only when both of the following are true: ①The motor encoder is an absolute encoder (PnF00.W = 1); ②The absolute encoder is in normal use (Pn040 = 1). ● The multi-turn count range is [-32768, 32767]; exceeding this range triggers an ER.C21 error. ● When the rotation-count upper-limit function (Pn276 ≠ 0) is enabled, multi-turn overflow detection is automatically disabled.

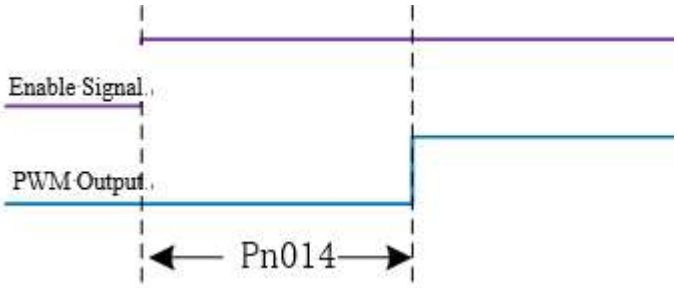
Pn011	User-defined External Pulse Signal Filter Time	○	Address: 0x0011
Default: 400	Range: 0~5000	Unit: 12.5ns	Control mode: P
Description	● Used to set the filter time for external pulse command signals. ● When Pn011=12 (12×12.5ns=150ns), any pulse shorter than 150ns is treated as noise.  ● Calculation: If the host PC's maximum pulse frequency is f kHz, then: $$Pn011 = \frac{40000}{f} + 1$$ Note: The custom time is calculated with hardware filtering disabled; when hardware filtering is enabled, adjust it according to actual conditions.		

Pn012	External Regenerative Resistor Power	○	Address: 0x0012
Default: 0	Range: 0~65535	Unit: 10W	Control mode: P S T
Description	● When an external regenerative resistor is connected, set Pn012 to match its power rating. **Note:** The appropriate value depends on the resistor's cooling condition. If an alarm occurs while the resistor temperature is low, a higher setting can be used; otherwise, use a lower value. ● For **natural convection cooling**, set below 20% of the resistor's rated power. ● For **forced-air cooling**, set below 50% of the resistor's rated power. For example, if a naturally cooled external resistor is rated 100W, then 100W×20%=20 W, so Pn012 should be set to "2" (unit=10W).		

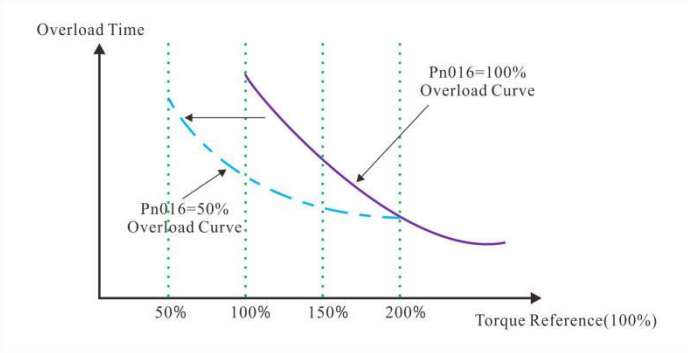
Caution	
	● On drives with a built-in regenerative braking resistor, setting Pn012 to 0 enables protection of the internal resistor. ● An improper setting may trigger an ER.320 error.

Pn013	External Regenerative Resistance	○	Address: 0x0013
Default: 0	Range: 0~65535	Unit: 1Ω	Control mode: Ⓟ Ⓢ Ⓣ
Description	When an external regenerative resistor is connected, set Pn013 to match its resistance.		

Caution	
	● The min. regeneration resistance allowed for each power band is different, see "Regenerative Resistor" for details, otherwise the internal components of the servo unit may be damaged.

Pn014	Servo Drive Power ON Delay	○	Address: 0x0014
Default: 0	Range: 0~6000	Unit: ms	Control mode: Ⓟ Ⓢ Ⓣ
Description	Set a period of time after the bus voltage is built up before power to the drive is enabled. 		

Pn015	Motor Overload Alarm Level	■	Address: 0x0015
Default: 50	Range: 1~100	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ

Pn016	Overload Base Current Derating	■	Address: 0x0016
Default: 100	Range: 10~100	Unit: %	Control mode: P S T
Description	● This function allows early detection of ER.720 [Max. Continuous Overload Error] to prevent motor overheating and burning. ● By using the derated base current (calculated as shown below) to trigger the overload alarm, fault detection time is shortened. Note that the detection threshold of ER.710 [Max.Instantaneous Overload Error] can not be changed. ● Derated Motor Base Current = Motor Base Current × Motor Overload Base Current Derating Terminology: ● Motor Base Current: The threshold current at which overload detection begins. ● Motor Overload Base Current Derating: The percentage by which the motor base current is reduced. Example: As shown in the figure below, if Pn018 is set to 50%, then an overload error is reported earlier because the motor overload is calculated from 50% of the base current. And after Pn018 is changed, the overload error detection time is changed accordingly, so overload alarm detection time is changed, too.  		

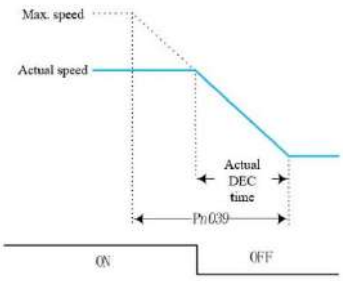
Pn030	Absolute Position Single-Turn Max. Limit (Internal Soft Limit)	○	Address: 0x0030★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: Encoder unit	Control mode: P S T

Pn032	Absolute Position Multiple Turn Max. Limit (Internal Soft Limit)	○	Address: 0x0032
Default: 32767	Range: -32768~32767	Unit: Turn	Control mode: Ⓟ Ⓢ Ⓣ
Description	The drive compares its internal position feedback with the set limit values; if the limit is exceeded, it immediately issues an alarm and executes the corresponding action. The user can enable or disable this feature via Pn00A.3. Note: ● When (Pn030×one turn pulse count+Pn032) is lower than (Pn035×one turn pulse count+Pn033), the absolute position limit minimum and maximum values will be interchanged; ● Only applicable to absolute encoders.		

Pn033	Absolute Position Min. Limit (Internal Soft Limit)	○	Address: 0x0033★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: Encoder unit	Control mode: Ⓟ Ⓢ Ⓣ

Pn035	Absolute Position Multiple Turn Min. Limit (Internal Soft Limit)	○	Address: 0x0035
Default: -32768	Range: -32768~32767	Unit: Turn	Control mode: Ⓟ Ⓢ Ⓣ
Description	The drive compares its internal position feedback with the set limit values; if the limit is exceeded, it immediately issues an alarm and executes the corresponding action. Users can make relevant selections via Pn000A.3. Note: ● When (Pn030×one turn pulse count+Pn032) is lower than (Pn035×one turn pulse count+Pn033), the absolute position limit minimum and maximum values will be interchanged; ● Only applicable to absolute encoders.		

Pn036	Absolute Position Limit Hysteresis	○	Address: 0x0036
Default: 200	Range: 0~30000	Unit: Encoder unit	Control mode: Ⓟ Ⓢ Ⓣ
Description	When using this function, since it is encoder unit for soft limit, frequent entering and exiting may occur after entering soft limit state. Setting an appropriate hysteresis value based on actual conditions effectively prevents this frequent toggling.		

Pn039	Servo OFF DEC Stop Time	○	Address: 0x0039
Default: 0	Range: 0~10000	Unit: 1ms	Control mode: P S T
Description			

Caution	
⚠	● When Pn039=0, the deceleration-stop function on servo OFF is disabled. ● The servo OFF stop function applies only when using external input terminals or internal Pn001.X; it does not apply to other enable methods. ● Effective in position, speed, and torque modes.

Pn040	Absolute Encoder Mode	■	Address: 0x0040
Default: 0x0001	Range: 0x0000~0x0021	Unit: N/A	Control mode: P S T

Setting			
	0-th bit X	Standard pulse-type servo absolute encoder	
		0	Normal use as absolute encoder
		1	Use as incremental encoder
	1-st bit Y	EtherCAT bus type servo absolute encoder	
		0	Normal use as absolute encoder
		1	Use as incremental encoder
		2	Use as single-turn absolute encoder
	2-nd bit Z	Reserved parameter (Do not use)	
	3-rd bit W	Reserved parameter (Do not use)	

Caution	
⚠	● To use the absolute encoder normally, an external battery is required; otherwise, the drive will issue a battery-undervoltage alarm or error.

Pn041	Absolute Encoder Battery Undervoltage Error/Alarm	○	Address: 0x0041
Default: 0x0000	Range: 0x0000~0x0001	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Used to configure the operating method for a battery-backed absolute encoder.

Setpoint	Description	Comment
0	Set battery undervoltage as an error (Er.830)	-
1	Set battery undervoltage as an alarm (AL.930)	-

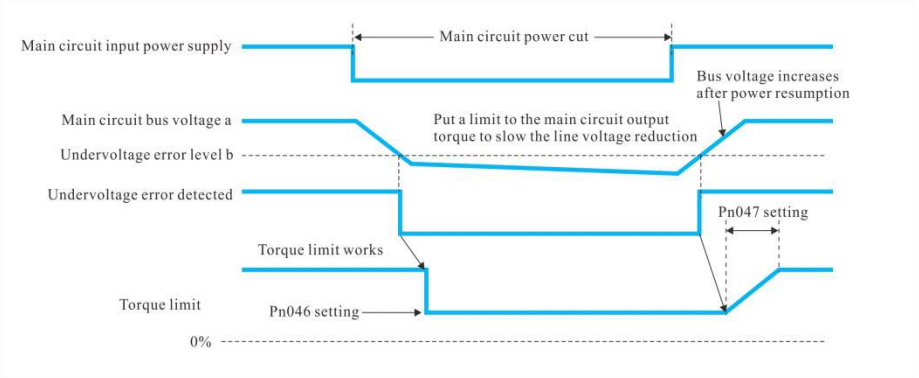
- Er.830: Within 8 seconds after power-on, the drive checks whether the encoder's backup battery is normal; after 8 seconds, it stops checking the battery voltage.
- AL.930: After power-on, the drive continuously monitors the encoder's backup battery voltage; if it falls below the alarm threshold, an alarm is issued, and when it rises above the threshold, the alarm clears automatically.

Pn045	Main Circuit (DC) Undervoltage Detection Mode	○	Address: 0x0045
Default: 0x0000	Range: 0x0000~0x0002	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Used to configure the torque threshold for drive output.

Setpoint	Description	Comment
0	OFF	-
1	ON	-
2	ON, apply torque limit via Pn046 and Pn047	-

Pn046	Torque Limit during Main Circuit Voltage Drop	○	Address: 0x0046
Default: 50	Range: 0~100	Unit: 1%	Control mode: Ⓟ Ⓢ Ⓣ
Description	Percentage of motor's rated torque.		

Pn047	Torque Limit Release Time During Main Circuit Drop	○	Address: 0x0047
Default:100	Range: 0~1000	Unit: 1ms	Control mode: P S T
Description	When an undervoltage alarm occurs, the drive internally limits torque. Once the alarm clears, torque is restored according to this set time. 		

Pn050	Torque Limit Mode	○	Address: 0x0050
Default: 0x0002	Range: 0x0000~0x0005	Unit: N/A	Control mode: P S

Used to configure the torque threshold for drive output.

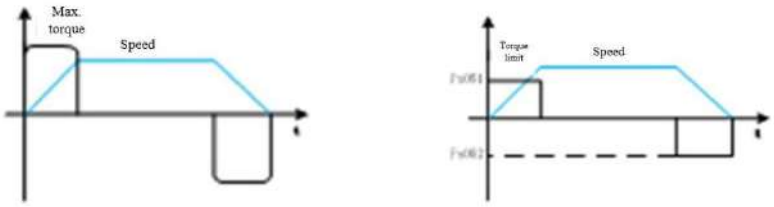
Setpoint	Description	Comment
0	Reserved	-
1	Reserved	-
2	Internal forward/reverse limit	-
3	Internal forward limit and internal reverse limit	-
4	External terminal limit	-
5	Limit active when pulse command=0 and positioning complete	-

Torque Limit Mode Description

Pn050		FWD	REV	Description
0		Reserved		-
1		Reserved		-
2		Pn051		Set max. torque for both forward/reverse rotation using Pn051.
3		Pn051	Pn052	Set max. forward torque limit using Pn051; Set max. reverse torque limit using Pn052.
4	OFF	Pn054		Set torque limit value via external terminal. TL-SEL=Low (OFF): Set max. torque for both directions using Pn054. TL-SEL=High (ON): Set max. torque for both directions using Pn055.
	ON	Pn055		

5	OFF	Pn051	①External pulse command = 0 (after filtering);② Positioning complete. When either condition is not met: set max. torque for both directions using Pn051. When both conditions are met: set max. torque for both directions using Pn052.
	ON	Pn052	
Caution			
			● Torque limiting is only effective in non-torque control modes. In torque control mode, torque limiting can only be implemented via: ①Pn051 for both forward and reverse torque limiting; ②External torque limiting, switched to external torque limiting (Pn051) via an external X terminal.

Pn051	Internal FWD Torque Limit	○	Address: 0x0051
Default: by model	Range: 0~500	Unit: 1%	Control mode: P S T

Pn052	Internal REV Torque Limit	○	Address: 0x0052
Default: by model	Range: 0~500	Unit: 1%	Control mode: P S T
Description	Output torque can be limited to protect the machines. Internal torque limiting continuously restricts the maximum output torque via parameter settings. Under torque mode, set Pn051 or Pn052 to select the limit direction. Note: (1) The setting unit is a percentage of the motor's rated torque. (2) If the torque limit is set too low, insufficient torque may occur during servo motor acceleration or deceleration. Without internal torque limit With internal torque limit 		

Pn053	Emergency Stop Torque	○	Address: 0x0053
Default: 800	Range: 0~800	Unit: 1%	Control mode: P S T
Description	Display the maximum torque during an emergency stop under specific conditions (e.g., overtravel).		

Pn054	External Torque Limit 1	○	Address: 0x0054
Default: 100	Range: 0~500	Unit: 1%	Control mode: Ⓟ Ⓢ

Pn055	External Torque Limit 2	○	Address: 0x0055
Default: 100	Range: 0~500	Unit: 1%	Control mode: Ⓟ Ⓢ

Pn056	Overspeed Torque Threshold	○	Address: 0x0056
Default: 100	Range: 0~255	Unit: 1%	Control mode: Ⓟ Ⓢ Ⓣ
Description	If the current torque exceeds the Pn056 and the speed exceeds the Pn057, the overspeed detection function is activated. Note: (1) The torque threshold is relative to the maximum torque; (2) Setting Pn056 to 0 disables the overspeed detection function.		

Pn057	Overspeed Threshold	○	Address: 0x0057
Default: 20	Range: 0~200	Unit: 1%	Control mode: Ⓟ Ⓢ Ⓣ
Description	If the current torque exceeds the Pn056 and the speed exceeds the Pn057, the overspeed detection function is activated. Note: The speed threshold is relative to the maximum speed.		

Pn059	KTY-type Sensor Overheat Threshold	○	Address: 0x0059
Default: 0	Range: 0~180	Unit: 1℃	Control mode: Ⓟ Ⓢ Ⓣ
Description	Provide overheat protection for motors equipped with KTY-type sensors. When the motor temperature exceeds this threshold, an overheat alarm (ER.42A) is issued. Note:①Setting the threshold to 0 disables the overheat monitoring function. ②This parameter applies only to motors fitted with KTY-type temperature sensors.		

Pn076	Serial Encoder Single-Turn Resolution	■	Address: 0x0076
Default: 0x0020	Range: 0x0000~0x0051	Unit: N/A	Control mode: P S T

Setting	0-th bit X	Resolution adjustment switch	
		0	OFF
		1	ON
	1-st bit Y	Single-turn resolution setting	
		0	15-bit
		1	16-bit
		2	17-bit
		3	18-bit
		4	19-bit
		5	20-bit
	2-nd bit Z	Reserved parameter (Do not use)	
	3-rd bit W	Reserved parameter (Do not use)	

Caution	
⚠	● Applies only to serial encoders. ● If the set resolution is lower than the encoder's actual resolution, the actual resolution is used.

Pn07F	Serial Encoder Multi-turn Clear & Error Reset	○	Address: 0x007F
Default: 0x0000	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: P S T
Description	This function code resets the multi-turn count and battery fault of a serial encoder. Writing "1" executes the reset, identical in effect to the auxiliary function Fn008, allowing users to zero the absolute encoder's multi-turn count via RS-485.		

Caution	
⚠	● Applies only to absolute serial encoders. ● Pn07F is not retained after power-off and clears itself after execution. ● Do not execute while the drive is enabled.

Pn080	Local Communication Address (485&CANopen)	■	Address: 0x0080
Default: 1	Range: 0~255	Unit: N/A	Control mode: P S T
Description	This function code sets the drive's axis address: 0: Broadcast address. The host controller can write to all drives simultaneously; drives act on broadcast frames but do not reply. 1~255: Unique addresses for each drive in a multi-drive network to avoid communication conflicts. Note: For CANopen models, the maximum allowable address is 63.		

Pn081	Local Communication Format	■	Address: 0x0081
Default: 0x0502	Range: 0x0000~0x0655	Unit: N/A	Control mode: P S T

Setting	0-th bit X	RS485 communication baud rate	
		0	4800bps
		1	9600bps
		2	19200bps
		3	38400bps
		4	57600bps
		5	115200bps
	1-st bit Y	485 communication parity mode	
		0	No parity, data bit: 8, stop bit: 1 (N-8-1)
		1	Even parity, data bit: 8, stop bit: 1 (E-8-1)
		2	Odd parity, data bit: 8, stop bit: 1 (O-8-1)
		3	No parity, data bit: 8, stop bit: 2 (N-8-2)
		4	Even parity, data bit: 8, stop bit: 2 (E-8-2)
		5	Odd parity, data bit: 8, stop bit: 2 (O-8-2)
	2-nd bit Z	CAN communication baud rate	
		0	20K
		1	50K
		2	100K
		3	125K
		4	250K
		5	500K
		6	1000K(1M)
	3-rd bit W	Reserved parameter (Do not change)	

Caution	
	• The servo drive's baud rate and communication parity mode must match the host controller's settings; otherwise, communication will fail.

<table>
<tr><td>Pn085</td><td colspan="2">Communication Funcode Write to EEPROM</td><td>○</td><td>Address: 0x0085</td></tr>
<tr><td>Default: 0x0000</td><td colspan="2">Range: 0x0000~0x0111</td><td>Unit: N/A</td><td>Control mode: P S T</td></tr>
<tr><td rowspan="7">Setting</td><td rowspan="3">0-th bit
X</td><td colspan="3">485 communication</td></tr>
<tr><td>0</td><td colspan="2">OFF</td></tr>
<tr><td>1</td><td colspan="2">ON</td></tr>
<tr><td rowspan="3">1-st bit
Y</td><td colspan="3">CANopen communication</td></tr>
<tr><td>0</td><td colspan="2">OFF</td></tr>
<tr><td>1</td><td colspan="2">ON</td></tr>
<tr><td>2-nd bit
Z</td><td colspan="3">Reserved parameter (Do not change)</td></tr>
<tr><td>3-rd bit
W</td><td colspan="3">Reserved parameter (Do not change)</td></tr>
<tr><td>Description</td><td colspan="4">If a modified parameter does not need to be retained after power-off, set its storage option to “Not Stored.” Otherwise, frequent bulk writes to EEPROM may damage it and cause an Er.021 error.</td></tr>
</table>

<table>
<tr><td>Pn087</td><td colspan="2">485 Communication Register Address Mapping</td><td>○</td><td>Address: 0x0087</td></tr>
<tr><td>Default: 0x0000</td><td colspan="2">Range: 0x0000~0x0011</td><td>Unit: N/A</td><td>Control mode: P S T</td></tr>
<tr><td rowspan="7">Setting</td><td rowspan="3">0-th bit
X</td><td colspan="3">1# Register address mapping switch</td></tr>
<tr><td>0</td><td colspan="2">OFF</td></tr>
<tr><td>1</td><td colspan="2">ON</td></tr>
<tr><td rowspan="3">1-st bit
Y</td><td colspan="3">2# Register address mapping switch</td></tr>
<tr><td>0</td><td colspan="2">OFF</td></tr>
<tr><td>1</td><td colspan="2">ON</td></tr>
<tr><td>2-nd bit
Z</td><td colspan="3">Reserved parameter (Do not use)</td></tr>
<tr><td>3-rd bit
W</td><td colspan="3">Reserved parameter (Do not use)</td></tr>
</table>

<table>
<tr><td>Pn088</td><td colspan="2">1# Register Mapping Source Address</td><td>○</td><td>Address: 0x0088</td></tr>
<tr><td>Default: 0x0000</td><td>Range: 0x0000~0x1FFF</td><td>Unit: N/A</td><td colspan="2">Control mode: P S T</td></tr>
</table>

Pn089	1# Register Mapping Target Address	○	Address: 0x0089
Default: 0x0000	Range: 0x0000~0x1FFF	Unit: N/A	Control mode: P S T

Pn08A	2# Register Mapping Source Address	○	Address: 0x008A
Default: 0x0000	Range: 0x0000~0x1FFF	Unit: N/A	Control mode: P S T

Pn08B	2# Register Mapping Target Address	○	Address: 0x008B
Default: 0x0000	Range: 0x0000~0x1FFF	Unit: N/A	Control mode: P S T

4.3.2 Gain Parameters (Pn1xx)

Pn100	Moment of Inertia Ratio (J)	○	Address: 0x0100
Default: 100	Range: 0~20000	Unit: 1%	Control mode: P S T
Description	Set the ratio of total inertia to the motor's rotor inertia. $Pn100=\frac{\text{load inertia + motor rotor inertia}}{\text{motor rotor inertia}} \times 100\%$		

Pn101	ASR Proportional Gain (ASR_KP)	○	Address: 0x0101
Default: 40.0	Range: 1.0~2000.0	Unit: Hz	Control mode: P S T
Description	Set the automatic speed regulator gain (ASR_KP), determining the speed control loop's responsiveness. The larger the ASR_KP value is, the higher the speed loop response frequency and the better it follows speed commands. Higher setting improves the response characteristics, but it may lead to vibration.		

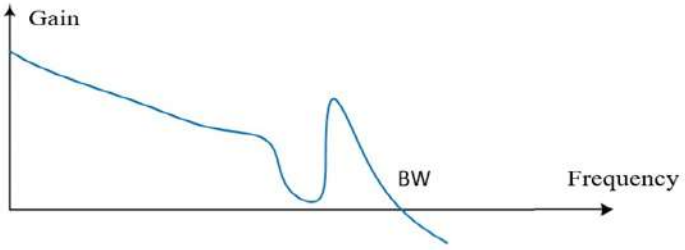
Pn102	ASR Integral Time (ASR_KI)	○	Address: 0x0102
Default: 20.00	Range: 0.15~512.00	Unit: ms	Control mode: P S T
Description	Set the automatic speed regulator integral time (ASR_Ki), determining the speed control loop's responsiveness. The smaller the ASR_Ki value is, the higher the response frequency of the speed loop and the better it follows speed commands. Lower setting improves the response characteristics, but it may lead to vibration.		

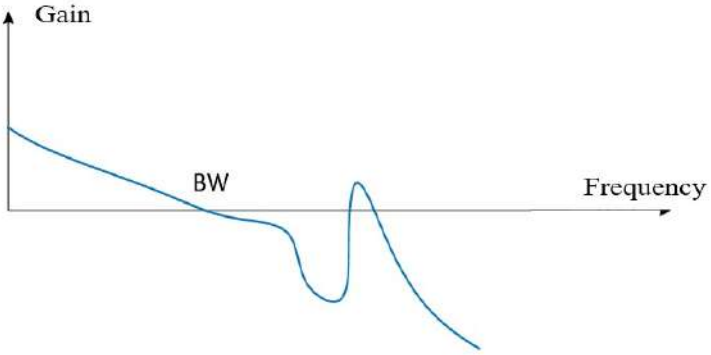
Pn103	APR Proportional Gain (APR_KP)	○	Address: 0x0103
Default: 40.0	Range: 1.0~2000.0	Unit: 1/s	Control mode: P S T
Description	Set the automatic position regulator gain (APR_KP), determining the position control system's responsiveness. The larger the APR_KP value is, the higher the position response frequency, the better it follows position commands, the smaller the position deviation, and the shorter the positioning setup time. However, excessive APR_KP may cause oscillation.		

Pn104	Torque Reference Filter Time	○	Address: 0x0104
Default: 1.00	Range: 0.00~655.35	Unit: ms	Control mode: Ⓟ Ⓢ Ⓣ

Description

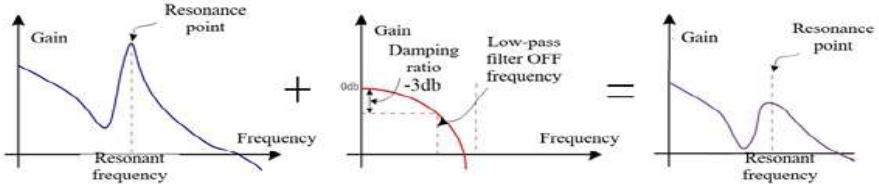
Set the low-pass filter time constant for resonance suppression. A value of 0 disables the filter. When the resonance occurs in the mechanical structure, it is possible that the rigidity of the drive control system is too large or the corresponding bandwidth is too fast, so the resonance of the control system can be suppressed by this parameter together with the parameter of resonance suppression notch filter without changing the control parameters.





When the torque command filter time parameter is gradually increased from 0, the corresponding BW point will become smaller and smaller. Resonance frequency generation will be solved, but the bandwidth and phase boundaries of the system response will be reduced at the same time.

When low-pass filter suppression is ON:



As the time constant increases from 0, the filter's pass-band decreases. Although the resonance problem is mitigated, the system's response bandwidth and phase margin are reduced, making the system less stable.

So we recommend:

Adjust value of stable control range: $\mathrm{Pn104[ms]} = \frac{1000}{2\pi \times \mathrm{Pn102[Hz]} \times 4}$

Adjust value of limit control range: $\mathrm{Pn104[ms]} = \frac{1000}{2\pi \times \mathrm{Pn102[Hz]} \times 1}$

Pn105	2nd ASR Proportional Gain	○	Address: 0x0105
Default: 40.0	Range: 1.0~2000.0	Unit: Hz	Control mode: Ⓟ Ⓢ Ⓣ

Pn106	2nd ASR Integral Time	○	Address: 0x0106
Default: 20.0	Range: 0.15~512.00	Unit: ms	Control mode: Ⓟ Ⓢ Ⓣ

Pn107	2nd APR Proportional Gain	○	Address: 0x0107
Default: 40.0	Range: 1.0~2000.0	Unit: 1/s	Control mode: Ⓟ Ⓢ Ⓣ

Pn108	2nd Torque Command Filter Time	○	Address: 0x0108
Default: 1.00	Range: 0.00~655.35	Unit: 1ms	Control mode: Ⓟ Ⓢ Ⓣ

Pn10A	Auto-Tuning Mode	○	Address: 0x010A
Default: 0	Range: 0~1	Unit: -	Control mode: Ⓟ Ⓢ Ⓣ

Setpoint	Description	Comment
0	Manual	-
1	Standard rigidity table	-

Pn10B	Rigidity Level	○	Address: 0x010B
Default: 15	Range: 1~32	Unit: -	Control mode: Ⓟ Ⓢ Ⓣ

Pn110	Auto Gain Shift	○	Address: 0x0110
Default:0x0000	Range: 0x0000~0x0051	Unit: N/A	Control mode: P S T

Setting	0-th bit X	Gain shift method	
		0	Manual: Shift gains via external input signal (G-SEL).
		1	Automatic: Automatically shift between Gain 1 and Gain 2 based on Condition A. If Condition A is true, shift from Gain 1 to Gain 2. If Condition A is false, shift from Gain 2 to Gain 1.
	1-st bit Y	Condition A:	
		0	Position-complete signal (/COIN) ON
		1	Position-complete signal (/COIN) OFF
		2	Near-position signal (/NEAR) ON
		3	Near-position signal (/NEAR) OFF
		4	Position command filter output = 0 and command input OFF
		5	Position command pulse input ON
	2-nd bit Z	Reserved parameter (Do not change)	
	3-rd bit W	Reserved parameter (Do not change)	

Pn112	Gain Shift Time 1	○	Address: 0x0112
Default: 0	Range: 0~65535	Unit: ms	Control mode: P S T

Pn113	Gain Shift Time 2	○	Address: 0x0113
Default: 0	Range: 0~65535	Unit: ms	Control mode: P S T

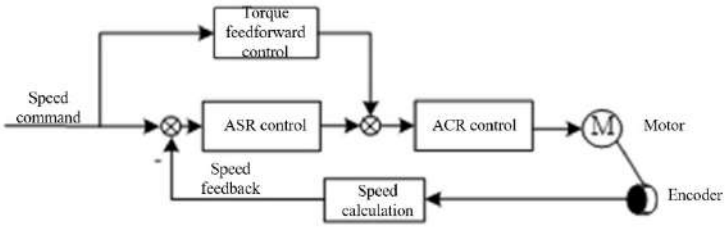
Pn114	Gain Shift Delay Time 1	○	Address: 0x0114
Default: 0	Range: 0~65535	Unit: ms	Control mode: P S T

Pn115	Gain Shift Delay Time 2	○	Address: 0x0115
Default: 0	Range: 0~65535	Unit: ms	Control mode: P S T

Pn120	Position Integral Time	○	Address: 0x0120
Default: 0.0	Range: 0.0~5000.0	Unit: ms	Control mode: P
Description	Enable the integrator in the position loop, typically used for electronic cam and electronic shaft functions. Note: A value of 0 disables position-loop integral action.		

Pn121	Velocity Feedforward Gain	○	Address: 0x0121
Default: 0	Range: 0~100	Unit: 1%	Control mode: P
Description	Shorten the positioning time by applying a feedforward term during position control. The feedforward command is generated by differentiating the host's position instruction. Increasing the gain improves tracking when commands change smoothly; decreasing it reduces mechanical vibration when commands are irregular. Feedforward gain reduces phase-lag error.		

Pn122	Velocity Feedforward Filter Time	○	Address: 0x0122
Default: 2.00	Range: 0.00~64.00	Unit: ms	Control mode: P

Pn123	Torque Feedforward Gain	○	Address: 0x0123
Default: 0	Range: 0~500	Unit: %	Control mode: P
Description	Torque feedforward is effective only in position-control and speed-control modes. 		

Pn124	Torque Feedforward Filter Time	○	Address: 0x0124
Default: 2.00	Range: 0.00~64.00	Unit: ms	Control mode: P S

Pn125★	Velocity Feedback Low-Pass Filter Time	○	Address: 0x0125
Default: 0.00	Range: 0.00~655.35	Unit: ms	Control mode: P S T
Description	Apply a first-order low-pass filter to the speed-loop feedback. It removes resonance and high-frequency noise from the speed signal. This setting will smooth the feedback speed and reduce vibration, but if it is too high, it will introduce delay, degrading response performance and slowing down the loop control.		

Pn130	ASR P/PI Control	■	Address: 0x0130
Default: 0x0000	Range: 0x0000~0x0114	Unit: N/A	Control mode: P S T

Setting	0-th bit X	ASR P/PI control mode switch:	
		0	Switch by internal torque command (Pn132)
		1	Switch by speed command (Pn133)
		2	Switch by acceleration (Pn134)
		3	Switch by position error (Pn135)
		4	No mode-switch function
	1-st bit Y	ASR control mode	
		0	PI control
		1	I-P control
	2-nd bit Z	Reserved parameter (Do not change)	
	3-rd bit W	Reserved parameter (Do not change)	

Pn132	ASR P/PI Shift Condition (Torque Reference)	○	Address: 0x010C
Default: 200	Range: 0~800	Unit: 1%	Control mode: P S T

Pn133	ASR P/PI Shift Condition (Speed Reference)	○	Address: 0x010D
Default: 0	Range: 0~10000	Unit: 1rpm	Control mode: P S T

Pn134	ASR P/PI Shift Condition (Acceleration)	○	Address: 0x010E
Default: 0	Range: 0~30000	Unit: 1rpm/s	Control mode: P S T

Pn135	ASR P/PI Shift Condition (Position Deviation)	○	Address: 0x010F
Default: 0	Range: 0~10000	Unit: 1 reference unit	Control mode: P S T

Pn140	A-type Vibration Suppression Control Switch		○	Address: 0x0140
Default: 0x0010	Range: 0x0000~0x0011	Unit: N/A		Control mode: P S
	0-th bit X	A-type vibration suppression control switch		
		0	OFF	
		1	ON	
	1-st bit Y	A-Type vibration suppression auto-tuning		
		0	OFF	
		1	ON	
	2-nd bit Z	Reserved parameter (Do not change)		
	3-rd bit W	Reserved parameter (Do not change)		

Pn141	A-Type Vibration Suppression Gain Compensation		○	Address: 0x0141
Default: 100	Range: 1~1000	Unit: %		Control mode: P S T

Pn142	A-Type Vibration Suppression Frequency		○	Address: 0x0142
Default: 100.0	Range: 1.0~2000.0	Unit: Hz		Control mode: P S T

Pn143	A-Type Vibration Suppression Damping Gain		○	Address: 0x0143
Default: 0	Range: 0~300	Unit: %		Control mode: P S T

Pn144	A-Type Vibration Suppression Filter Constant 1 Compensation		○	Address: 0x0144
Default: 0	Range: -10.00~10.00	Unit: ms		Control mode: P S T

Pn145	A-Type Vibration Suppression Filter Constant 2 Compensation		○	Address: 0x0145
Default: 0	Range: -10.00~10.00	Unit: ms		Control mode: P S T

Pn14A	Type-II Notch Filter 1 Frequency		○	Address: 0x014A
Default: 5000	Range: 50~5000	Unit: Hz		Control mode: P S T
Description: Set the center frequency of the notch filter 1.				

Pn14B	Type-II Notch Filter 1 Attenuation Rate	○	Address: 0x014B
Default: 0	Range: 0~32	Unit: dB	Control mode: Ⓟ Ⓢ Ⓣ
Description: Set the attenuation rate of the notch filter 1; a value of 0 disables the filter.			

Pn14C	Type-II Notch Filter 2 Frequency	○	Address: 0x014C
Default: 5000	Range: 50~5000	Unit: Hz	Control mode: Ⓟ Ⓢ Ⓣ
Description: Set the center frequency of the notch filter 2.			

Pn14D	Type-II Notch Filter 2 Attenuation Rate	○	Address: 0x014D
Default: 0	Range: 0~32	Unit: dB	Control mode: Ⓟ Ⓢ Ⓣ
Description: Set the attenuation rate of the notch filter 2; a value of 0 disables the filter.			

Pn150	Notch Filter Function Switch 1	○	Address: 0x0150
Default: 0x0000	Range: 0x0000~0x1101	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Setting			
	0-th bit X	Notch filter 1	
		0	OFF
		1	ON
	1-st bit Y	Reserved parameter (Do not change)	
	2-nd bit Z	Notch filter 2	
		0	OFF
		1	ON
	3-rd bit W	Friction compensation	
		0	OFF
		1	ON

Pn151	Notch Filter Function Switch 2		○	Address: 0x0151
Default: 0x0101	Range: 0x0000~0x0101		Unit: N/A	Control mode: P S T
Setting	0-th bit X	Notch filter 1 auto-tuning		
		0	OFF	
		1	ON	
	1-st bit Y	Reserved parameter (Do not change)		
	2-nd bit Z	Notch filter 2 auto-tuning		
		0	OFF	
		1	ON	
	3-rd bit W	Reserved parameter (Do not change)		

Pn152	Auto Notch Resonance Detection Sensitivity		○	Address: 0x0152
Default: 100	Range: 1~200		Unit: %	Control mode: P S T

Pn153	Notch Filter 1 Frequency		○	Address: 0x0153
Default: 5000	Range: 50~5000		Unit: Hz	Control mode: P S T

Pn154	Notch Filter 1Q Value		○	Address: 0x0154
Default: 0.70	Range: 0.50~10.00		Unit: N/A	Control mode: P S T

Pn155	Notch Filter 1 Depth		○	Address: 0x0155
Default: 0.000	Range: 0.000~1.000		Unit: N/A	Control mode: P S T

Pn156	Notch Filter 2 Frequency		○	Address: 0x0156
Default: 5000	Range: 50~5000		Unit: Hz	Control mode: P S T

Pn157	Notch Filter 2Q Value		○	Address: 0x0157
Default: 0.70	Range: 0.50~10.00		Unit: N/A	Control mode: P S T

Pn158	Notch Filter 2 Depth	○	Address: 0x0158
Default: 0.000	Range: 0.000~1.000	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Pn159	Notch Filter 3 Frequency	○	Address: 0x0159
Default: 5000	Range: 50~5000	Unit: Hz	Control mode: Ⓟ Ⓢ Ⓣ
Description: Set the center frequency of the notch filter; a value of 5000 disables the filter.			

Pn15A	Notch Filter 3Q Value	○	Address: 0x015A
Default: 0.70	Range: 0.50~10.00	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Pn15B	Notch Filter 3 Depth	○	Address: 0x015B
Default: 0.000	Range: 0.000~1.000	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Pn15C	Notch Filter 4 Frequency	○	Address: 0x015C
Default: 5000	Range: 50~5000	Unit: Hz	Control mode: Ⓟ Ⓢ Ⓣ
Description: Set the center frequency of the notch filter; a value of 5000 disables the filter.			

Pn15D	Notch Filter 4Q Value	○	Address: 0x015D
Default: 0.70	Range: 0.50~10.00	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Pn15E	Notch Filter 4 Depth	○	Address: 0x015E
Default: 0.000	Range: 0.000~1.000	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Pn161	Oscillation Compensation Gain	○	Address: 0x0161
Default: 100	Range: 10~1000	Unit: %	Control mode: Ⓟ Ⓢ

Pn162	2nd Oscillation Compensation Gain	○	Address: 0x0162
Default: 100	Range: 10~1000	Unit: %	Control mode: Ⓟ Ⓢ

Pn163	Oscillation Compensation Factor	○	Address: 0x0163
Default: 0	Range: 0~100	Unit: %	Control mode: Ⓟ Ⓢ

Pn164	Oscillation Compensation Frequency Correction	○	Address: 0x0164
Default: 0.0	Range: 0.0~1000.0	Unit: Hz	Control mode: P S

Pn165	Oscillation Compensation Gain Correction	○	Address: 0x0165
Default: 100	Range: 0~1000	Unit: %	Control mode: P S

Pn175	Tuning-Free Mode Switch	■	Address: 0x0175
Default: 0x1400	Range: 0x0000~0x2911	Unit: N/A	Control mode: P

Setting	0-th bit X	Tuning-free mode		
		0	OFF	
		1	ON	
	1-st bit Y	Tuning-free speed control		
		0	Speed control only	
		1	Speed control, with host as position controller	
	2-nd bit Z	Tuning-free rigidity		
		0	Rigidity 0	Low response
		1	Rigidity 1	
		2	Rigidity 2	
		3	Rigidity 3	
		4	Rigidity 4	
		5	Rigidity 5	
		6	Rigidity 6	
		7	Rigidity 7	
		8	Rigidity 8	
		9	Rigidity 9	High response
	3-rd bit W	Tuning-free load inertia		
		0	Small	
		1	Medium	
		2	Large	

Pn17A	Tuning-Free Disturbance Compensation Gain	○	Address: 0x017A
Default: 600.0	Range: 0:0.0~6553.5	Unit: Hz	Control mode: Ⓟ Ⓢ

Pn17B	Tuning-Free Inertia Correction Coefficient	○	Address: 0x017B
Default: 100	Range: 0~100	Unit: %	Control mode: Ⓟ Ⓢ

Pn17C	Tuning-Free Torque Filter Time	○	Address: 0x017C
Default: 0.10	Range: 0.00~655.35	Unit: ms	Control mode: Ⓟ Ⓢ

Pn17D	Tuning-Free Speed-Feedback LPF Time	○	Address: 0x017D
Default: 0.10	Range: 0.00~655.35	Unit: ms	Control mode: Ⓟ Ⓢ

Pn185	Motor Abnormal Vibration Detection	○	Address: 0x0185
Default: 0x0000	Range: 0x0000~0x0002	Unit: N/A	Control mode: Ⓟ

Setting			
	0-th bit X	Motor abnormal vibration detection	
		0	OFF
		1	ON and report AL.911
		2	ON and report ER.520
	1-st bit Y	Reserved parameter (Do not change)	
	2-nd bit Z	Reserved parameter (Do not change)	
	3-rd bit W	Reserved parameter (Do not change)	

Pn186	Motor Abnormal Vibration Detection Sensitivity	○	Address: 0x0186
Default: 100	Range: 50~500	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ

Pn187	Motor Abnormal Vibration Detection Value	○	Address: 0x0187
Default: 50	Range: 0~5000	Unit: rpm	Control mode: Ⓟ Ⓢ Ⓣ
Description	Set the vibration-detection threshold: Detection value = Pn186×Pn187. Lower threshold increases sensitivity but may cause false alarms during normal operation.		

Pn192	Overshoot Detection Sensitivity(/COIN Signal Width)	○	Address: 0x0192
Default: 100	Range: 0~100	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ

Pn193	Max. Gain during Tuning	○	Address: 0x0193
Default: 300.0	Range: 1.0~400.0	Unit: Hz	Control mode: Ⓟ Ⓢ Ⓣ

4.3.3 Position Parameters (Pn2xx)

Pn200	Position Command Source	■	Address: 0x0200
Default: 0x0020	Range: 0x0000~0x0084	Unit: N/A	Control mode: Ⓟ

Setting	0-th bit X	External pulse logic	
		0	High-speed pulse sequence
		1	Low-speed pulse sequence
		2	Reserved
		3	Internal position command
	1-st bit Y	External pulse filter time (software filter)	
		0	Filter 1 (~52Kpps, 9.6μs)
		1	Filter 2 (~104Kpps, 4.8μs)
		2	Filter 3 (~208Kpps, 2.4us)
		3	Filter 4 (~416Kpps, 1.2μs)
		4	Filter 5 (~832Kpps, 0.6μs)
		5	Filter 6 (~1664Kpps, 0.3μs)
		6	Filter 7 (~3328Kpps, 0.15μs)
		7	Filter 8 (~4Mpps, 0.125μs)
		8	Pn011 setting
	2-nd bit Z	Reserved parameter (Do not change)	
	3-rd bit W	Reserved parameter (Do not change)	

Caution	
	● The maximum pulse frequency for open-collector inputs is 200kHz; filters 0~2 apply. ● Open-collector and differential pulse inputs have different pin assignments—refer to the wiring diagram.

Pn201	Pulse Reference Logic	■	Address: 0x0202
Default: 0x0000	Range: 0x0000~0x0004	Unit: N/A	Control mode: P

Set the type of incoming pulse signal under position mode.

Setpoint	Description	Comment
0	Pulse+Direction	-
1	CW+CCW pulse sequences	-
2~3	Reserved	-
4	90° difference of orthogonal AB-phase (4×)	-

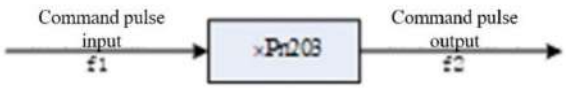
Pn202	Pulse Reference Logic	■	Address: 0x0202
Default: 0x0000	Range: 0x0000~0x0001	Unit: N/A	Control mode: P

Setting	0-th bit X	Pulse reference logic	
		0	Positive (original direction)
		1	Negative (reversed)
	1-st bit Y	Reserved parameter (Do not change)	
	2-nd bit Z	Reserved parameter (Do not change)	
	3-rd bit W	Reserved parameter (Do not change)	

Pn203	External Pulse Multiplier	○	Address: 0x0203
Default: 1	Range: 1~100	Unit: ×1	Control mode: P

Description

Used to apply a multiplier to external pulse commands. The multiplier can be switched via digital input terminal X (P-GAIN). Can be set from 1× up to N× (max 100×).



Note: This multiplier only applies to external pulse commands; it does not affect internal functions such as JOG or auto-tuning.

Pn204	Electronic Gear Numerator (N)	○	Address: 0x0204★
Default: 1	Range: 0~1073741824	Unit: N/A	Control mode: P
Description	Set the numerator value of the gear ratio.		

Caution	
	If this function code is set to 0, the drive automatically sets the numerator based on the encoder resolution. For example: ● When the serial encoder resolution is 17 bits and is set to 0, the drive sets N=131072; ● When the serial encoder resolution is 24 bits and is set to 0, the drive sets N=16777216; ● When the serial encoder resolution is 23 bits and is set to 0, the drive sets N=8388608.

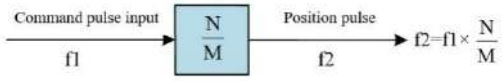
Pn206	Electronic Gear Denominator (M)	○	Address: 0x0206★
Default: 1	Range: 1~1073741824	Unit: NA	Control mode: P

Description

The electronic gear feature allows for simple adjustment of the travel ratio. However, a higher electronic gear ratio may cause position references to become step-like (quantized). Mitigate this problem by applying S-curve acceleration/deceleration or low-pass filtering to smooth the reference signals. For example, When the electronic gear ratio=1, the motor encoder resolution is 10,000 pulses per revolution (ppr).

When the electronic gear ratio=0.5, every 2 reference pulses make the motor rotate by 1 pulse.

Incorrect settings may cause sudden jerks in the servo motor. Users must configure the ratio properly to avoid instability.



If the mechanical reduction ratio between the motor shaft and load is A:B (i.e., the motor rotates B turns while the load rotates A turns), the electronic gear ratio (N/M) should be set as:

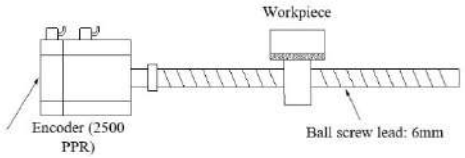
- Electronic gear ratio= M/N=Encoder Resolution×B/Desired Reference Pulses per Load Revolution×A

Example: Calculating Reference Pulses with/without Electronic Gear Ratio

Servo motor encoder resolution: 10,000 pulses/revolution (ppr)

Ball screw lead: 6mm/rev

Target workpiece movement: 10mm



- Case 1: Without Electronic Gear Ratio

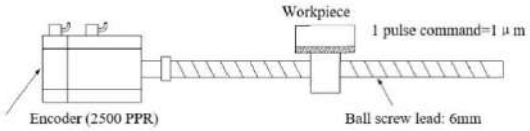
Motor rotation per 6 mm movement: 1 revolution

Motor rotation for 10 mm: 10mm/6mm/rev=1.6 rev

Required reference pulses (4x multiplier applied): 1.

6rev×10,000 ppr=16,666 pulses

Thus host controller must output: 16,666 pulses



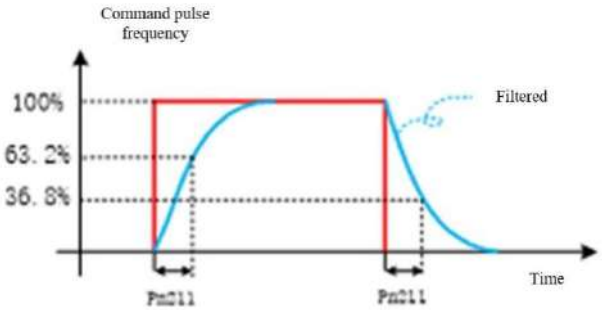
- Case 2: With Electronic Gear Ratio

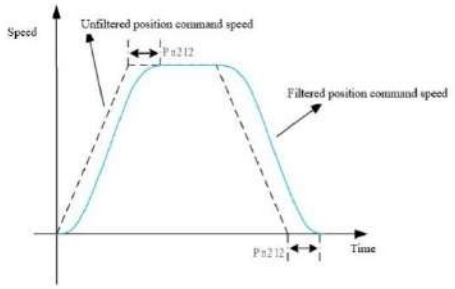
Target movement in μm: 10 mm=10,000 μm

Since 1 pulse = 1 μm: 10,000 μm/1μm/pulse=10,000 pulses

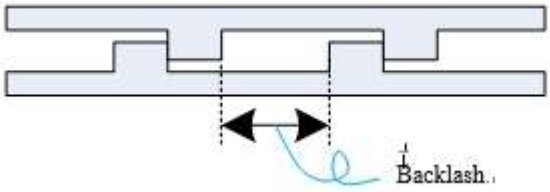
Thus host controller only needs to output: 10,000 pulses

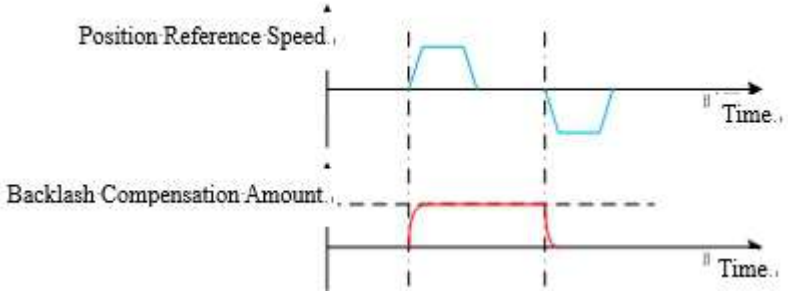
Caution	
	● Change the electronic gear ratio only when the motor is stopped or running at low speed to avoid excessive vibration. If vibration occurs during switching, use position smoothing parameters (e.g., S-curve acceleration/deceleration or low-pass filtering) to mitigate instability. ● If the electronic gear ratio is modified during a segment's execution, the change does not take effect immediately. And the new ratio is applied only after the current segment completes and before the next segment begins. ● The electronic gear ratio changes take effect immediately for incoming pulse references. ● The electronic gear ratio must be within the drive's allowable range, or it will report ER.D04 (Electronic gear ratio setting overrun).

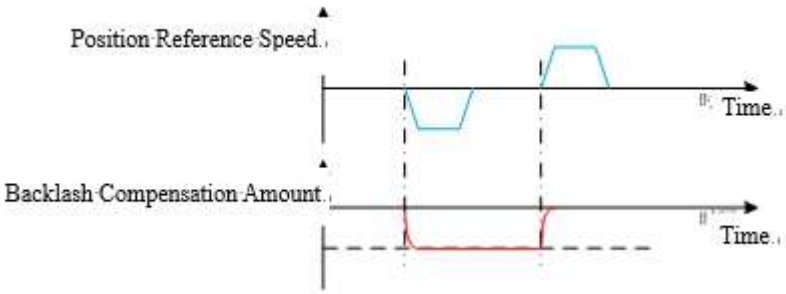
Pn211	Position Reference Filter Time	○	Address: 0x0211
Default: 0.0	Range: 0.0~655.0	Unit: ms	Control mode: P
Description	Set to apply 1st-order low-pass filter to buffer the excessive changes in the input reference pulse signals. Note: This function is invalid when set to 0.  Typical applications are: ①No ACC/DEC on host controllers; ②High electronic gear ratios; ③Low pulse frequency; ④Step-like motions.		

Pn212	Position Reference Moving Average Filter	○	Address: 0x0212
Default: 0.0	Range: 0.0~1000.0	Unit: ms	Control mode: P
Description	Set to smooth the step-like position references at the beginning and end of the motion, but it may cause a delay to the position references. 		

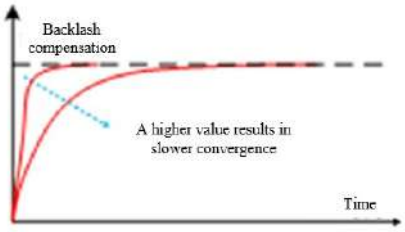
Notes
● When set to 0, the position command linear-filter function is disabled.

<table>
<tr><td>Pn220</td><td colspan="2">Backlash Compensation</td><td>■</td><td>Address: 0x0220</td></tr>
<tr><td>Default: 0x0000</td><td colspan="2">Range: 0x0000~0x0011</td><td colspan="2">Unit: N/A</td><td>Control mode: P</td></tr>
<tr><td rowspan="8">Setting</td><td rowspan="3">0-th bit
X</td><td colspan="3">Backlash compensation switch</td></tr>
<tr><td>0</td><td colspan="2">OFF</td></tr>
<tr><td>1</td><td colspan="2">ON</td></tr>
<tr><td rowspan="3">1-st bit
Y</td><td colspan="3">Backlash compensation direction</td></tr>
<tr><td>0</td><td colspan="2">Forward compensation</td></tr>
<tr><td>1</td><td colspan="2">Reverse compensation</td></tr>
<tr><td>2-nd bit
Z</td><td colspan="3">Reserved parameter (Do not use)</td></tr>
<tr><td>3-rd bit
W</td><td colspan="3">Reserved parameter (Do not use)</td></tr>
<tr><td>Description</td><td colspan="5">For ball screws and other similar drive mechanisms, there will be a repeatability error after a long period of wear and tear. Set backlash compensation at this time
to reduce the error caused by the design of the mechanism.
 

Pn220.Y = 0 (forward compensation)
 

Pn220.Y = 1 (reverse compensation)
 
</td></tr>
</table>

Pn221	Backlash Compensation Level	○	Address: 0x0221★
Default: 0.0	Range: -5000.0~5000.0	Unit: 0.1 reference unit	Control mode:Ⓟ

Pn223	Backlash Compensation Filter Time	○	Address: 0x0223
Default: 10.00	Range: 0.00~100.00	Unit: ms	Control mode:Ⓟ
Description	Set the filter time which is in an exponential relationship with the amount of backlash compensation and decides the rate of convergence of the compensation curve. This parameter determines the convergence speed of that compensation curve.  		

Pn232	LF Vibration Detection Sensitivity (/COIN Signal Width)	○	Address: 0x0232
Default: 40.0	Range: 0.1~300.0	Unit: %	Control mode:Ⓟ
Description	Set the threshold for low-frequency vibration detection, vibration detection value = Pn232 × Pn262. A lower threshold setting enables easier vibration detection.		

Pn233	Anti LF Vibration 1 Frequency A	○	Address: 0x0233
Default: 50.0	Range: 1.0~250.0	Unit: Hz	Control mode:Ⓟ

Pn234	Anti LF Vibration 1 Frequency B	○	Address: 0x0234
Default: 70.0	Range: 1.0~250.0	Unit: Hz	Control mode:Ⓟ

Pn235	Anti LF Vibration 2 Frequency	○	Address: 0x0235
Default: 200.0	Range: 1.0~200.0	Unit: Hz	Control mode:Ⓟ
Description	Set the center frequency for low frequency vibration suppression, this function is on when this function code is not 200.0Hz, and the response of the drive is slower. If the model following function is on (Pn240.X=1), users can also use this function when Pn240.Y=2.		

Pn236	Anti LF Vibration 2 Gain	○	Address: 0x0236
Default: 100	Range: 10~1000	Unit: %	Control mode:P
Description	Set the suppression gain for low-frequency vibration, the smaller this setting, the more obvious the suppression of vibration, but it may lead to excessive positioning time.		

Pn240	Model Following Control (MFC)	○	Address: 0x0240
Default: 0x0100	Range: 0x0000~0x1121	Unit: N/A	Control mode:P

Pn241	MFC Gain	○	Address: 0x0241
Default: 50.0	Range: 1.0~2000.0	Unit: 1/s	Control mode:P

Pn242	MFC Gain Correction	○	Address: 0x0242
Default: 100.0	Range: 50.0~200.0	Unit: %	Control mode:P

Pn243	MFC Velocity Feedforward Compensation	○	Address: 0x0243
Default: 100.0	Range: 0.0~1000.0	Unit: %	Control mode:P

Pn244	MFC Offset (Positive)	○	Address: 0x0244
Default: 100.0	Range: 0.0~1000.0	Unit: %	Control mode:P

Pn245	MFC Offset (Negative)	○	Address: 0x0245
Default: 100.0	Range: 0.0~1000.0	Unit: %	Control mode:P

Pn246	MFC Gain 2	○	Address: 0x0246
Default: 50.0	Range: 1.0~2000.0	Unit: 1/s	Control mode:P

Pn247	MFC Gain 2 Correction	○	Address: 0x0247
Default: 100.0	Range: 50.0~200.0	Unit: %	Control mode:P

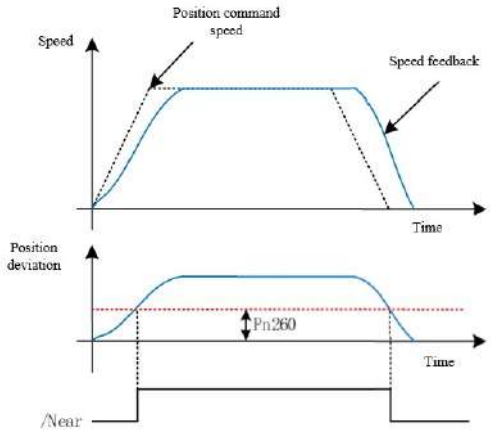
Pn248※	Control Switch	■	Address: 0x0248
Default: 0x0001	Range: 0x0000~0x0011	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Setting	0-th bit Ⓧ	MFC mode	
		0	I-type MFC
		1	II-type MFC
	1-st bit Ⓨ	Tuning-free type	
		0	I-type no-tuning
		1	II-type no-tuning
	2-nd bit Ⓩ	Reserved parameter (Do not change)	
	3-rd bit Ⓦ	Reserved parameter (Do not change)	

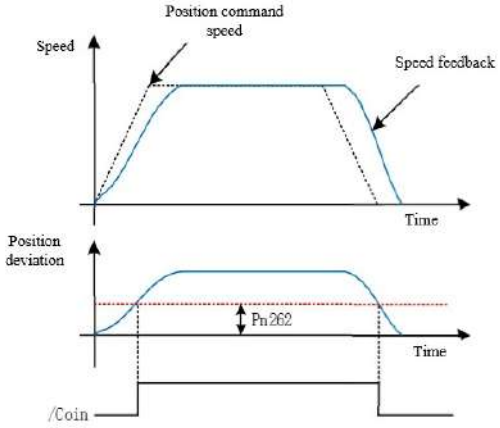
Pn260	/Near Signal Width	○	Address: 0x0260★
Default: 1073741824	Range: 1~1073741824	Unit: Reference unit	Control mode: Ⓟ

Description

Output this signal when the difference between the command pulse number of the host controiller and the servomotor movement (position deviation) is lower than Pn260. In position control, the host controller can receive /NEAR before /COIN to prepare for the sequence of movements or other operations that are to be performed after the positioning is completed.



Note: Set a value greater than Pn262 [/COIN Signal Width].

Pn262	/COIN Signal Width	○	Address: 0x0262
Default: 7	Range: 0~1073741824	Unit: Reference unit	Control mode: P
Description	Output this signal when the difference between the command pulse number of the host controiller and the servomotor movement (position deviation) is lower than Pn262.  Note: ① This parameter has no effect on the final positioning accuracy. ② If the setting is too high while the deviation is small in low-speed operation, /COIN may be output for a long time, at this time, please lower this setting until the signal is no longer output.		

Pn264	Position Deviation Error Level	○	Address: 0x0264★
Default: 5242880	Range: 1~1073741824	Unit: Reference unit	Control mode: P
Description	If the deviation between the position reference and the actual feedback during motor operation exceeds this setting, a position deviation error is generated. Normal position deviation depends on motion speed, gains, feedforward, etc., so in practice set this parameter using the following formula: $Pn264=\frac{F_c}{K_p}\times(1.2\sim2.0)$ In the formula: F_c: Max. position reference pulse (pulse/s); K_p: Position loop gain (1/s); 1.2~2.0: Safety factor (protection against frequent excessive position deviation).		

Pn266	Position Deviation Alarm Level	○	Address: 0x0266
Default: 100	Range: 10~100	Unit: %	Control mode: P
Description	Set the excessive position deviation alarm threshold. The drive generates an excessive position deviation alarm when the current position deviation value is higher than this setting.		

Pn267	Servo-ON Position Deviation Error Level	○	Address: 0x0267★
Default: 5242880	Range: 1~1073741823	Unit: Reference unit	Control mode: P
Description	If the position deviation exceeds this setting at the moment when servo drive starts to operate, the drive generates this alarm.		

Pn269	Servo-ON Position Deviation Alarm Level	○	Address: 0x0269
Default: 100	Range: 10~100	Unit: %	Control mode: P
Description	If the position deviation exceeds this setting at the moment when servo drive starts to operate, the drive generates this alarm.		

Pn270	Servo-ON Speed Limit	○	Address: 0x0270
Default: 1000	Range: 0~10000	Unit: rpm	Control mode: P

Pn271	External Reference Pulse Multiplier	■	Address: 0x0271
Default: 0x0000	Range: 0x0000~0x0002	Unit: N/A	Control mode: P

Pn272	/CLR Condition	■	Address: 0x0272
Default: 0x0000	Range: 0x0000~0x0003	Unit: N/A	Control mode: P

Set the method of clearing the position deviation by /CLR signal in the position mode.

Setpoint	Description	Comment
0	At high level (H)	-
1	At rising edge	-
2	At low level (L)	-
3	At falling edge	-

/CLR signal status:

Clear at rising edge Clear at falling edge

Pn273	Position Deviation Clear Mode	■	Address: 0x0273
Default: 0x0000	Range: 0x0000~0x0002	Unit: N/A	Control mode: P

Set the work mode of the /CLR signal.

Setpoint	Description	Comment
0	ON under Servo OFF and errors	-
1	ON at /CLR signal only	-
2	ON under errors	-

Pn274	/COIN Output Sequence	○	Address: 0x0274
Default: 0x0000	Range: 0x0000~0x0002	Unit: N/A	Control mode: P

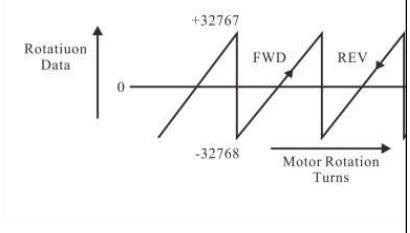
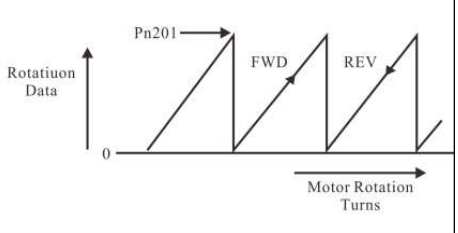
Set the output sequence of the /COIN signal.

Setpoint	Description	Comment
0	When the absolute value of the position deviation< Pn262 [/COIN Signal Width]	-
1	When the absolute value of position deviation<Pn262 [/COIN Signal Width] and the position reference filtered is 0.	-
2	When the absolute value of position deviation <Pn262 [/COIN Signal Width] and the position reference input is 0.	-

Pn276	Max. Rotation Turns	■	Address: 0x0276
Default: 0	Range: 0~30000	Unit: Turn	Control mode: P S T

Description

Set for position control of rotary parts such as turntables to keep the number of revolutions of the motor and the rotary table to an integer ratio without any decimals.

Pn201 = 0	Pn201 ≠ 0
	

Caution	
	● Effective only when using an absolute encoder. ● When Pn201 = 0, this setting is invalid.

<table>
<tr><td>Pn277</td><td colspan="2">Encoder Unidirection Mode</td><td>■</td><td>Address: 0x0277</td></tr>
<tr><td colspan="2">Default: 0x0000</td><td>Range: 0x0000~0x0011</td><td>Unit: N/A</td><td>Control mode: P S T</td></tr>
<tr><td rowspan="6">Setting</td><td rowspan="3">0-th bit
X</td><td colspan="3">Encoder Unidirection Mode Enable</td></tr>
<tr><td>0</td><td colspan="2">OFF</td></tr>
<tr><td>1</td><td colspan="2">ON</td></tr>
<tr><td rowspan="3">1-st bit
Y</td><td colspan="3">Position feedback direction</td></tr>
<tr><td>0</td><td colspan="2">Cyclic</td></tr>
<tr><td>1</td><td colspan="2">Non-cyclic accumulation</td></tr>
<tr><td>2-nd bit
Z</td><td colspan="3">Reserved parameter (Do not change)</td></tr>
<tr><td>3-rd bit
W</td><td colspan="3">Reserved parameter (Do not change)</td></tr>
<tr><td colspan="5">Caution</td></tr>
<tr><td>  </td><td colspan="4">• If Pn277 [Encoder Unidirection Mode] setting is wrong, it may cause an absolute position failure and a ER.840 prompt.</td></tr>
</table>

Pn290	Home Mode		○	Address: 0x0290
Default:0.100	Range: 0x0000~0x23B4	Unit: N/A		Control mode: Ⓟ Ⓢ Ⓣ
Setting	0-th bit Ⓧ	Home enable		
		0	OFF	
		1	ON by DI terminal	
		2	ON after power-up, and then enable the drive	
		3	Home immediately	
		4	Current position as the home position	
	1-st bit Ⓨ	Home mode		
		0	Positive, deceleration point and home point are home switches	
		1	Negative, deceleration point and home point are home switches	
		2	Positive, deceleration point and home point are Z signals	
		3	Negative, deceleration point and home point are Z signals	
		4	Positive, deceleration point is the home switch, and home point is the motor Z signal	
		5	Negative, deceleration point is the home switch, and home point is the motor Z signal	
		6	Positive, deceleration point and home point are positive OT switches	
		7	Negative, deceleration point and home point are negative OT switches	
		8	Positive, deceleration point and home point are Z signals	
		9	Negative, deceleration point and home point are Z signals	
		A	Absolute position homing	
		B	Current position as the home position	
	2-nd bit Ⓩ	Trigger mode		
		0	Trigger at low level and stop at high level	
		1	Trigger at rising edge	
		2	Trigger at falling edge	
		3	Trigger at high level and stop at low	
	3-rd bit Ⓦ	Home timeout unit		
		0	1ms	
		1	10ms	
		2	100ms	

Pn291	Home Velocity (High)	○	Address: 0x0291
Default: 100.0	Range: 0.0~3000.0	Unit: rpm	Control mode: P
Description	Set the speed during search for the reference point (deceleration point), which determines the homing range. Do not set this value too low or it may report the home timeout error.		

Pn292	Home Velocity (Low)	○	Address: 0x0292
Default: 10.0	Range: 0.0~1000.0	Unit: rpm	Control mode: P
Description	Set the speed during search for home point and finally locate it. Do not set this value too high, or home position may be lost or the difference too large.		

Pn293	Home ACC/DEC Time	○	Address: 0x0293
Default: 3000	Range: 0~3000	Unit: ms	Control mode: P
Description	Set the time required for the motor to accelerate from 0rpm to 3000rpm. And set the time required for the motor to decelerate from 3000rpm to 0 rpm.		

Pn294	Home Position Offset	○	Address: 0x0294★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: Reference unit	Control mode: P
Description	Set the distance for the motor after finding the home position, i.e., the motor's absolute position coordinates.		

Pn296	Absolute Zero Multi-turn Value	○	Address: 0x0296
Default: 0	Range: -32768~32767	Unit: rev	Control mode: P S T

Pn297	Absolute Zero Single-turn Value	○	Address: 0x0297★
Default: 0	Range: 0~2147483647	Unit: Encoder unit	Control mode: P S T
Description	The multi-turn value and the single-turn value of together indicate the target absolute position of the motor, which is used to set the target position of the motor when Pn290.Y is set to A, i.e., the multi-turn and the single-turn feedback of the motor at shutdown are equal to or close to the settings here.		

Pn299	Home Timeout	○	Address: 0x0299
Default: 10000	Range: 0~65535	Unit: ms	Control mode: P S T
Description	● Set the maximum time to search for a home signal. ● If this setting is too low or the home signal is not searched within this setting, the drive will generate ER.8A1. Note: This function is off when set to 0.		

4.3.4 Velocity Parameters (Pn3xx)

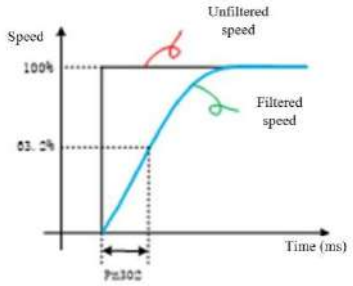
Pn300	Velocity Reference Source	○	Address: 0x0300
Default: 0000	Range: 0x0000~0x0005	Unit: N/A	Control mode: S

Set the speed reference source in speed mode.

Setpoint	Description	Comment		
0	Funcode	Pn304 [Velocity Reference Source]		
2	Reserved	-		
3	Reserved	-		
4	Mixed sources	SPDB	SPDA	Reference source
		0	0	Pn303.X setting
		0	1	Pn303.Y setting
		1	0	Pn303.Z setting
		1	1	Pn303.W setting
5	Reserved	-		

Pn301	Velocity Reference Direction	○	Address: 0x0301
Default: 0x0000	Range: 0x0000~0x0001	Unit: N/A	Control mode: S

Setpoint	Description	Comment
0	Positive logic	-
1	Negative logic	-

Pn302	Velocity Reference Filter Time	○	Address: 0x0302
Default: 0.40	Range: 0.00~655.35	Unit: ms	Control mode: S
Description	Set to apply low-pass filter to the speed reference to smooth it. 		

Pn303	Speed Control 1	■	Address: 0x0303
Default: 0x0000	Range: 0x0000~0x2222	Unit: N/A	Control mode: S

Setting			
	0-th bit X	Velocity reference source 1	
		0	Funcode (Pn304)
	1-st bit Y	Velocity reference source 2	
		0	Funcode (Pn305)
	2-nd bit Z	Velocity reference source 3	
		0	Funcode (Pn306)
	3-rd bit W	Velocity reference source 4	
		0	Funcode (Pn307)

Pn304	Internal Velocity 0	○	Address: 0x0304
Default: 100	Range: -10000~10000	Unit: 1rpm	Control mode: S

Pn305	Internal Velocity 1	○	Address: 0x0305
Default: 200	Range: -10000~10000	Unit: 1rpm	Control mode: S

Pn306	Internal Velocity 2	○	Address: 0x0306
Default: 300	Range: -10000~10000	Unit: 1rpm	Control mode: S

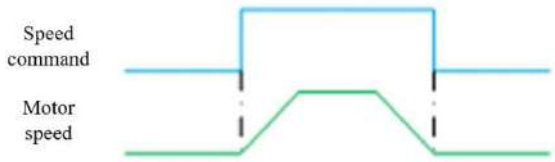
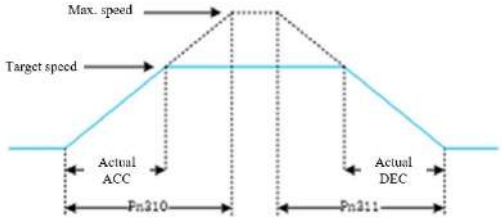
Pn307	Internal Velocity 3	○	Address: 0x0307
Default: 400	Range: -10000~10000	Unit: 1rpm	Control mode: S

Pn308	Internal Velocity Reference Unit	○	Address: 0x0308
Default: 0x0000	Range: 0x0000~0x0001	Unit: N/A	Control mode: S

Setpoint	Description	Comment
0	1rpm	-
1	0.1rpm	-

Caution	
	• This parameter applies only to internal velocity references Pn304~Pn307.

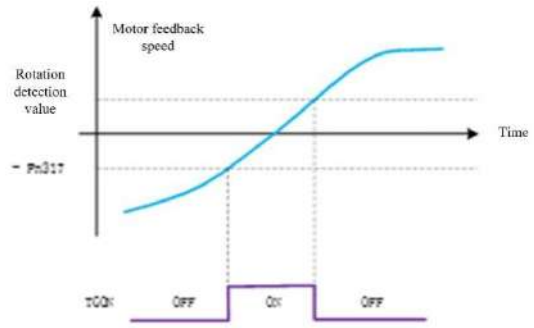
Pn310	Soft Start ACC Time	○	Address: 0x0310
Default: 200	Range: 0~10000	Unit: 1ms	Control mode: S

Pn311	Soft-Start DEC Time	○	Address: 0x0311
Default: 200	Range: 0~10000	Unit: 1ms	Control mode: S
Description	Set the acceleration time and deceleration time to convert a step speed reference into a smoother ACC/DEC speed reference.  Pn310: The time required for the motor to reach the maximum speed of the motor from the stop state. Pn311: The time required for the motor to reach the motor stop from the maximum speed. The actual acceleration and deceleration time is calculated by the following formula: 		

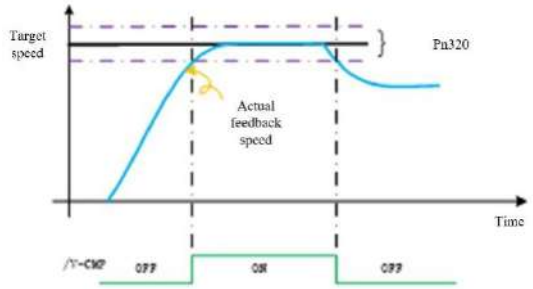
Pn313	Zero Clamping Velocity Level	○	Address: 0x0313
Default: 10	Range: 0~10000	Unit: rpm	Control mode: S
Description	Set this function to lock the servo drive when the zero-position clamping signal (/ZCLAMP) is on and the speed reference is lower than this setting here. At this time, the servo unit internally forms a position loop, and the speed command will not be taken. And it can be used for speed control systems when a position loop has yet to be configured in the host controller.		

Caution	
	• When the servo motor is clamped at zero position, it maintains a ±1 pulse fluctuation. Even if forced to rotate by external torque, it will return to the zero position.

Pn314	Max Zero Clamping Compensation Velocity	○	Address: 0x0314
Default: 1000	Range: 50~10000	Unit: rpm	Control mode: S
Description	Set to limit the maximum speed during return when the servomotor is fixed in the zero position and moves by external force.		

Pn317	/TGON Signal Width	○	Address: 0x0317
Default: 20	Range: 1~10000	Unit: rpm	Control mode: P S T
Description	Set the valid motor speed feedback range during which / TGON will be output. 		

Pn318	Max. Motor Speed	○	Address: 0x0318
Default: 10000	Range: 0~10000	Unit: rpm	Control mode: P S
Description	Set the maximum running speed of the servo motor. When this setting is greater than the maximum motor speed, take the latter as the actual maximum speed.		

Pn320	/V-CMP Signal Width	○	Address: 0x0320
Default: 10	Range: 0~100	Unit: rpm	Control mode: Ⓟ Ⓢ Ⓣ
Description	Set to tell whether the actual speed reaches the speed reference. If the deviation value between the motor feedback speed and the speed reference is within this setting, it means that the user speed is reached, and the output terminal assigned to /V-CMP signal outputs a high level(ON). Example: Pn320=50rpm, the target speed is 2000rpm, the motor speed is in the range of 1950rpm~2050rpm, then /V-CMP signal is sent. 		

4.3.5 Torque Parameters (Pn4xx)

<table>
<tr><td>Pn400</td><td colspan="3">Torque Control 1</td><td>■</td><td colspan="3">Address: 0x0400</td></tr>
<tr><td colspan="2">Default: 0x0020</td><td colspan="2">Range: 0x0000~0x0045</td><td>Unit: N/A</td><td colspan="3">Control mode: T</td></tr>
<tr><td rowspan="20">Setting</td><td rowspan="11">0-th bit
X</td><td colspan="6">Torque reference source</td></tr>
<tr><td>0</td><td colspan="2">Funcode</td><td colspan="3">Pn410</td></tr>
<tr><td>1</td><td colspan="2">Reserved</td><td colspan="3">-</td></tr>
<tr><td>2</td><td colspan="2">Reserved</td><td colspan="3">-</td></tr>
<tr><td rowspan="5">3</td><td rowspan="5">Mixed sources</td><td>TorqB</td><td>TorqA</td><td>Reference source</td></tr>
<tr><td>0</td><td>0</td><td>Pn409.X setting</td></tr>
<tr><td>0</td><td>1</td><td>Pn409.Y setting</td></tr>
<tr><td>1</td><td>0</td><td>Pn409.Z setting</td></tr>
<tr><td>1</td><td>1</td><td>Pn409.W setting</td></tr>
<tr><td>4</td><td colspan="2">Single-trigger mode</td><td colspan="3">-</td></tr>
<tr><td>5</td><td colspan="2">CANopen</td><td colspan="3">-</td></tr>
<tr><td rowspan="6">1-st bit
Y</td><td colspan="6">Torque mode-velocity limit source</td></tr>
<tr><td>0</td><td colspan="2">Reserved</td><td colspan="3">-</td></tr>
<tr><td>1</td><td colspan="2">Reserved</td><td colspan="3">-</td></tr>
<tr><td>2</td><td colspan="2">Funcode</td><td colspan="3">Pn415 setting</td></tr>
<tr><td>3</td><td colspan="2">DI terminals</td><td colspan="3">OFF: Pn415
ON: Pn416</td></tr>
<tr><td>4</td><td colspan="2">Torque reference direction</td><td colspan="3">Positive: Pn415 setting Negative: Pn416 setting</td></tr>
<tr><td>2-nd bit
Z</td><td colspan="6">Reserved parameter (Do not change)</td></tr>
<tr><td>3-rd bit
W</td><td colspan="6">Reserved parameter (Do not change)</td></tr>
</table>

Pn401	Torque Reference 2nd Low-pass Filter OFF Frequency	○	Address: 0x0401
Default: 5000	Range: 100~5000	Unit: Hz	Control mode: T
Description	This function is invalid when set to 5000.		

Pn402	Torque Reference 2nd Low-pass Filter Q Value	○	Address: 0x0402
Default: 0.50	Range: 0.50~1.00	Unit: N/A	Control mode: T

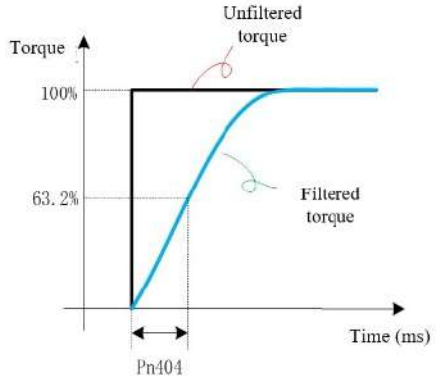
Pn403	Torque Reference Direction	○	Address: 0x0403
Default: 0x0000	Range: 0x0000~0x0001	Unit: N/A	Control mode: T

Setpoint	Description	Comment
0	Positive logic	-
1	Negative logic	-

Caution

- Pn403 and external terminal signal (/TPR-D) are valid for torque references from the internal register.
- The logic for combining Pn403 with the external terminal signal (/TPR-D) is as follows (CCW direction as positive):

Target Torque Reference	External Terminal TPR-D	Pn403.X	Actual Reference Direction
Positive reference	OFF	0	FWD
		1	REV
	ON	0	REV
		1	FWD
Negative reference	OFF	0	REV
		1	FWD
	ON	0	FWD
		1	REV

Pn404	Torque Reference Filter Time	○	Address: 0x0404
Default: 0.00	Range: 0.00~655.35	Unit: ms	Control mode: T
Description	Set to apply a 1st order low-pass filter to the torque reference to smooth it. 		

Pn409	Torque Control 3	○	Address: 0x0409
Default: 0x0000	Range: 0x0000~0x2222	Unit: N/A	Control mode: T

Setting			
	0-th bit X	Torque reference source 1	
		0	Funcode (Pn410)
	1-st bit Y	Torque reference source 2	
		0	Funcode (Pn411)
	2-nd bit Z	Torque reference source 3	
		0	Funcode (Pn412)
	3-rd bit W	Torque reference source 4	
		0	Funcode (Pn413)

Pn410	Internal Torque Reference 1	○	Address: 0x0410
Default: 0.0	Range: -500.0~500.0	Unit: %	Control mode: T

Pn411	Internal Torque Reference 2	○	Address: 0x0411
Default: 0.0	Range: -500.0~500.0	Unit: %	Control mode: T

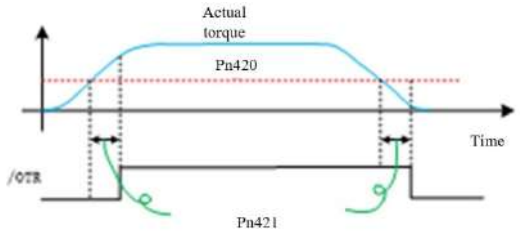
Pn412	Internal Torque Reference 3	○	Address: 0x0412
Default: 0.0	Range: -500.0~500.0	Unit: %	Control mode: T

Pn413	Internal Torque Reference 4	○	Address: 0x0413
Default: 0.0	Range: -500.0~500.0	Unit: %	Control mode: T

Pn415	Torque Mode Internal Speed Limit 1	○	Address: 0x0415
Default: 1000	Range: 0~10000	Unit: rpm	Control mode: T

Pn416	Torque Mode Internal Speed Limit 2	○	Address: 0x0416
Default: 1000	Range: 0~10000	Unit: rpm	Control mode: T

Pn420	Torque Reference Coincidence	○	Address: 0x0420
Default: 100.0	Range: 0.0~500.0	Unit: %	Control mode: P S T

Pn421	Torque Reference Coincidence Window	○	Address: 0x0421
Default: 5	Range: 0~1000	Unit: ms	Control mode: P S T
Description	When the torque output from the drive is greater than the set target torque for the set time here, the target torque arrival signal is output. 		

Pn430	Torque Control 2	○	Address: 0x0430
Default: 0x0001	Range: 0x0000~0x0013	Unit: N/A	Control mode: T

Setting	0-th bit X	Single torque reference trigger mode	
		0	Low level
		1	Rising edge
		2	High level
		3	Falling edge
	1-st bit Y	Torque mode control priority	
		0	Speed first
		1	Torque first
	2-nd bit Z	Reserved parameter (Do not change)	
	3-rd bit W	Reserved parameter (Do not change)	

4.3.6 Auxiliary Parameters (Pn5xx)

Pn500	JOG Speed	○	Address: 0x0500
Default: 200	Range: 0~3000	Unit: rpm	Control mode: P S T

Pn502	Program JOG Operation Mode		○	Address: 0x0502
Default: 0x0000	Range: 0x0000~0x0005	Unit: N/A		Control mode: Ⓟ Ⓢ Ⓣ

		Program JOG operation mode	
Setting	0-th bit Ⓧ	0	(Wait Pn535 → Forward move Pn531) × Move count Pn536
		1	(Wait Pn535 → Reverse move Pn531) × Move count Pn536
		2	(Wait Pn535 → Forward move Pn531) × Move count Pn536 (Wait Pn535 → Reverse move Pn531) × Move count Pn536
		3	(Wait Pn535 → Reverse move Pn531) × Move count Pn536 (Wait Pn535 → Forward move Pn531) × Move count Pn536
		4	(Wait Pn535 → Forward move Pn531 → Wait Pn535 → Reverse move Pn531) × Move count Pn536 Pn535→Reverse Pn531)×Pn536
		5	(Wait Pn535 → Reverse move Pn531 → Wait Pn535 → Forward move Pn531) × Move count Pn536 (Wait Pn535 → Forward move Pn531) × Move count Pn536
	1-st bit Ⓨ	Reserved parameter (Do not change)	
	2-nd bit Ⓩ	Reserved parameter (Do not change)	
	3-rd bit Ⓦ	Reserved parameter (Do not change)	

Pn503	Program JOG Travel Distance		○	Address: 0x0503★
Default: 60000	Range: 1~1073741824	Unit: Reference unit		Control mode: Ⓟ Ⓢ Ⓣ

Pn505	Program JOG ACC/DEC Time		○	Address: 0x0505
Default: 100	Range: 2~10000	Unit: ms		Control mode: Ⓟ Ⓢ Ⓣ

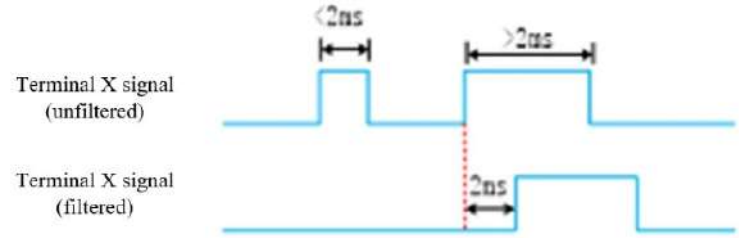
Pn506	Program JOG Delay		○	Address: 0x0506
Default: 100	Range: 0~10000	Unit: ms		Control mode: Ⓟ Ⓢ Ⓣ

Pn507	Program JOG Move Count	○	Address: 0x0507
Default: 1	Range: 0~1000	Unit: times	Control mode: Ⓟ Ⓢ Ⓣ
Description	Set the cycle times during jogging programs.		

Caution	
	● When Pn502 is set to 2 or 3 and Pn507 is set to 0, the JOG is invalid. ● If Pn507 = 0, move count is unlimited.

Pn508	Program Jog Velocity	○	Address: 0x0508
Default: 500	Range: 1~10000	Unit: rpm	Control mode: Ⓟ Ⓢ Ⓣ

4.3.7 Terminal Parameters(Pn6xx)

Pn600	X Terminal Filter Time	○	Address: 0x0600
Default: 2	Range: 0~3000	Unit: ms	Control mode: Ⓟ Ⓢ Ⓣ
Description	Set the filter time for external signals input to the drive from the X terminals. Example: When Pn600 filter time is 2ms, signals smaller than 2ms are filtered out. 		

Caution	
	● This filter time setting is valid for X1~X4; ● The monitoring function code Un100 monitors filtered DI terminals.

Pn601	X Terminal IN1 Configuration	○	Address: 0x0601
Default: 0x0001	Range: 0x0000~0x112F	Unit: N/A	Control mode: P S T

		Assigned value	
Setting	0-th bit 1-st bit X Y	00	OFF
		01	See Appendix 1 Terminal X Functions
		...	
		2F	
	2-nd bit Z	Input terminal contact property	
		0	Normally open (NO)
		1	Normally closed (NC)
	3-rd bit W	Input terminal signal source	
		0	External hardware terminal X1
		1	Pn630.Bit0

Pn602	X Terminal IN2 Configuration	○	Address: 0x0602
Default: 0x0002	Range: 0x0000~0x112F	Unit: N/A	Control mode: P S T

		Assigned value	
Setting	0-th bit 1-st bit X Y	00	OFF
		01	See Appendix 1 Terminal X Functions
		...	
		2F	
	2-nd bit Z	Input terminal contact property	
		0	Normally open (NO)
		1	Normally closed (NC)
	3-rd bit W	Input terminal signal source	
		0	External hardware terminal X2
		1	Pn630.Bit1

Pn603	X Terminal IN3 Configuration	○	Address: 0x0603
Default: 0x0003	Range: 0x0000~0x112F	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

		Assigned value	
Setting	0-th bit 1-st bit X Y	00	OFF
		01	See Appendix 1 Terminal X Functions
		...	
		2F	
	2-nd bit Z	Input terminal contact property	
		0	Normally open (NO)
		1	Normally closed (NC)
	3-rd bit W	Input terminal signal source	
		0	External hardware terminal X3
		1	Pn630.Bit2

Pn604	X Terminal IN4 Configuration	○	Address: 0x0604
Default: 0x0005	Range: 0x0000~0x112F	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

		Assigned value	
Setting	0-th bit 1-st bit X Y	00	OFF
		01	See Appendix 1 Terminal X Functions
		...	
		2F	
	2-nd bit Z	Input terminal contact property	
		0	Normally open (NO)
		1	Normally closed (NC)
	3-rd bit W	Input terminal signal source	
		0	External hardware terminal X4
		1	Pn630.Bit3

Pn611	Y Terminal OUT1 Configuration	○	Address: 0x0611
Default: 0x0001	Range: 0x0000~0x110F	Unit: N/A	Control mode: P S T

Setting	0-th bit 1-st bit X Y	Assigned value	
		00	See Appendix 2 Terminal Y Functions
		...	
		0F	
	2-nd bit Z	Output terminal contact property	
		0	Normally open (NO)
		1	Normally closed (NC)
	3-rd bit W	Output terminal signal source	
		0	Pn610
		1	Pn631.Bit0

Pn612	Y Terminal OUT2 Configuration	○	Address: 0x0612
Default: 0x0002	Range: 0x0000~0x110F	Unit: N/A	Control mode: P S T

Setting	0-th bit 1-st bit X Y	Assigned value	
		00	See Appendix 2 Terminal Y Functions
		...	
		0F	
	2-nd bit Z	Output terminal contact property	
		0	Normally open (NO)
		1	Normally closed (NC)
	3-rd bit W	Output terminal signal source	
		0	Pn610
		1	Pn631.Bit1

Pn630	Internal Setting on X Terminal	○	Address: 0x0630
Default: 0x0000	Range: 0x0000~0x03FF	Unit: N/A	Control mode: P S T

Setting	0-th bit X	Group 1		
		Bit0	vX1	
		Bit1	vX2	
		Bit2	vX3	
		Bit3	vX4	
	1-st bit Y	Group 2		
		Bit4	Reserved	
		Bit5	Reserved	
		Bit6	Reserved	
		Bit7	Reserved	
	2-nd bit Z	Group 3		
		Bit8	Reserved	
	3-rd bit W	Reserved parameter (Do not use)		

<table>
<tr><td>Pn631</td><td colspan="2">Internal Setting on Y Terminal</td><td>○</td><td>Address: 0x0631</td></tr>
<tr><td>Default: 0x0000</td><td>Range: 0x0000~0x003F</td><td colspan="2">Unit: N/A</td><td>Control mode: Ⓟ Ⓢ Ⓣ</td></tr>
<tr><td rowspan="10">Description</td><td rowspan="5">0-th bit
X</td><td colspan="3">Group 1</td></tr>
<tr><td>Bit0</td><td colspan="2">Y1 status</td></tr>
<tr><td>Bit1</td><td colspan="2">Y2 status</td></tr>
<tr><td>Bit2</td><td colspan="2">Reserved</td></tr>
<tr><td>Bit3</td><td colspan="2">Reserved</td></tr>
<tr><td rowspan="3">1-st bit
Y</td><td colspan="3">Group 2</td></tr>
<tr><td>Bit4</td><td colspan="2">Reserved</td></tr>
<tr><td>Bit5</td><td colspan="2">Reserved</td></tr>
<tr><td>2-nd bit
Z</td><td colspan="3">Reserved parameter (Do not use)</td></tr>
<tr><td>3-rd bit
W</td><td colspan="3">Reserved parameter (Do not use)</td></tr>
</table>

4.3.8 Expansion Parameters (Pn7xx)

Pn702	Advance Tuning Range	○	Address: 0x0702
Default: 3.0	Range: 0.5~10.0	Unit: Turn	Control mode: Ⓟ Ⓢ Ⓣ

Pn705	Inertia Recognition Initial Value	○	Address: 0x0705
Default: 300	Range: 0~20000	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ

Pn706	Vibration Detection Level in Inertia Detection	○	Address: 0x0706
Default: 250	Range: 0~5000	Unit: rpm	Control mode: Ⓟ Ⓢ Ⓣ

Pn720※	EasyFFT Sweep Start Frequency	○	Address: 0x0720
Default: 400	Range: 1~5000	Unit: Hz	Control mode: Ⓟ Ⓢ Ⓣ

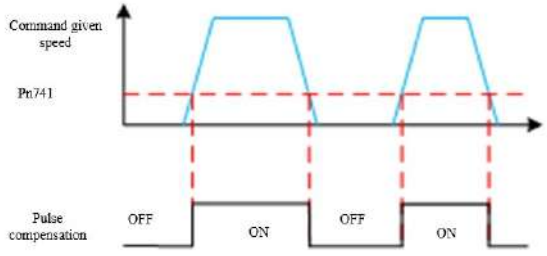
Pn721※	EasyFFT Sweep End Frequency	○	Address: 0x0721
Default: 4000	Range: 50~5000	Unit: Hz	Control mode: Ⓟ Ⓢ Ⓣ

Pn722※	EasyFFT Resonance Frequency Lower Limit	○	Address: 0x0722
Default: 500	Range: 50~5000	Unit: Hz	Control mode: Ⓟ Ⓢ Ⓣ

Pn723※	EasyFFT Scanning Torque Reference Range	○	Address: 0x0723
Default: 15	Range: 1~800	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ
Description	Set the amplitude value for the EasyFFT scanning torque references.		

Pn740※	Velocity Ripple Compensation	○	Address: 0x0740
Default: 0x0000	Range: 0x0000~0x0011	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Setting			
	0-th bit X	Velocity ripple compensation enable	
		0	OFF
		1	ON
	1-st bit Y	Activation condition	
		0	Velocity reference
		1	Motor speed
	2-nd bit Z	Reserved parameter (Do not use)	
	3-rd bit W	Reserved parameter (Do not use)	
Description	Set to turn the velocity ripple compensation on and off.		

Pn741※	Velocity Ripple Compensation Velocity	■	Address: 0x0741
Default: 0	Range: 0~10000	Unit: rpm	Control mode: Ⓟ Ⓢ Ⓣ
Description	When the speed ripple compensation function is enabled, even when the speed reference is 0 or the motor speed is 0, this compensation will still be processed. So users need to set the valid speed level to trigger the compensation function. 		

Pn742※	Velocity Ripple Compensation Gain	■	Address: 0x0742
Default: 80	Range: 0~100	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ

Pn743※	1st Order Ripple Frequency	■	Address: 0x0743
Default: 0	Range: 0~100	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Pn744※	1st Order Ripple Amplitude	■	Address: 0x0744
Default: 0.0	Range: -10.0%~10.0%	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ

Pn745※	1st Order Ripple Phase	■	Address: 0x0745
Default: 0	Range: 0~360	Unit: °(deg)	Control mode: Ⓟ Ⓢ Ⓣ

Pn746※	2nd Order Ripple Frequency	■	Address: 0x0746
Default: 0	Range: 0~100	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Pn747※	2nd Order Ripple Amplitude	■	Address: 0x0747
Default: 0.0	Range: -10.0%~10.0%	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ

Pn748※	2nd Order Ripple Phase	■	Address: 0x0748
Default: 0	Range: 0~360	Unit: °(deg)	Control mode: Ⓟ Ⓢ Ⓣ

Pn749※	3rd Order Ripple Frequency	■	Address: 0x0749
Default: 0	Range: 0~100	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Pn74A※	3rd Order Ripple Amplitude	■	Address: 0x074A
Default: 0.0	Range: -10.0%~10.0%	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ

Pn74B※	3rd Order Ripple Phase	■	Address: 0x074B
Default: 0	Range: 0~360	Unit: °(deg)	Control mode: Ⓟ Ⓢ Ⓣ

Pn74C※	4th Order Ripple Frequency	■	Address: 0x074C
Default: 0	Range: 0~100	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Pn74D※	4th Order Ripple Amplitude	■	Address: 0x074D
Default: 0.0	Range: -10.0%~10.0%	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ

Pn74E※	4th Order Ripple Phase	■	Address: 0x074E
Default: 0	Range: 0~360	Unit: °(deg)	Control mode: Ⓟ Ⓢ Ⓣ

Pn755	Field Weakening Control	○	Address: 0x0755
Default: 0x0001	Range: 0x0000~0x0001	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Setting			
	0-th bit X	Field weakening control enable	
		0	OFF
		1	ON
	1-st bit Y	Reserved parameter (Do not use)	
	2-nd bit Z	Reserved parameter (Do not use)	
	3-rd bit W	Reserved parameter (Do not use)	

Pn756	Field Weakening Control Proportional Gain	○	Address: 0x0756
Default: 30	Range: 10~1000	Unit: Hz	Control mode: Ⓟ Ⓢ Ⓣ

Pn757	Field Weakening Control Integral Time	○	Address: 0x0757
Default: 16	Range: 10~1000	Unit: us	Control mode: Ⓟ Ⓢ Ⓣ

Pn758	Field Weakening Control Integral Upper Limit	○	Address: 0x0758
Default: 100	Range: 0~200	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ

Pn759	Field Weakening Control Voltage	○	Address: 0x0759
Default: 115	Range: 50~150	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ

Pn75A	Max. Field Weakening Control Current	○	Address: 0x075A
Default: 95	Range: 50~150	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ

Pn75B	Field Weakening-Main Circuit Voltage Filter Time	○	Address: 0x075B
Default: 2.0	Range: 1.0~10.0	Unit: ms	Control mode: Ⓟ Ⓢ Ⓣ
Description	Set the number of moving average filters on the DC voltage used for weak magnetic calculations.		

Pn781※	Drive Bus Overvoltage Level	■	Address: 0x0781
Default: by model	Range: 0~1000	Unit: V	Control mode: Ⓟ Ⓢ Ⓣ
Description	● Set the bus over-voltage threshold so that when the bus voltage is greater than this setting, the drive will report over-voltage error. ● For DC 48V model, the default overvoltage level is 85V, and the setting range is 80V~90V. Note: Do not modify this parameter without manufacturer approval, or it may cause irreversible damage to the machine!		

Pn782※	Drive Regen Braking Level	■	Address: 0x0782
Default: by model	Range: 0~1000	Unit: V	Control mode: Ⓟ Ⓢ Ⓣ
Description	● Set the DC bus voltage threshold for regenerative braking. When exceeded, the drive dissipates energy to reduce the DC bus voltage. ● For DC 48V models: Defaulted to 75V (range: 70V~80V).		

Pn783※	Regen Braking Hysteresis Band Width	■	Address: 0x0783
Default: by model	Range: 0~50	Unit: V	Control mode: Ⓟ Ⓢ Ⓣ
Description	● For DC 48V models, the default value is 3V. ● Set this to effectively reduce frequent regenerative braking and prevent DC bus voltage relief. But a large value may cause great fluctuations in the DC bus.		

Pn784※	Drive Bus Undervoltage Level	■	Address: 0x0784
Default: by model	Range: 0~500	Unit: V	Control mode: Ⓟ Ⓢ Ⓣ
Description	● Set the bus under-voltage threshold so that when the bus voltage is lower than this setting, the drive will report under-voltage error. ● For DC 48V model, the default value of drive undervoltage point is 18V, and the setting range is 18V~20V.		

Pn785※	Drive Bus Undervoltage Filter Time	■	Address: 0x0785
Default: 10	Range: 0~2000	Unit: ms	Control mode: Ⓟ Ⓢ Ⓣ

Pn786※	Drive Bus Undervoltage Alarm Level	■	Address: 0x0785
Default: by model	Range: 0~1000	Unit: V	Control mode: Ⓟ Ⓢ Ⓣ
Description	● Set the bus undervoltage level so when the bus voltage is lower than this value, it will report undervoltage alarm. ● For DC 48V models, the drive undervoltage alarm value defaults to 20V.		

Pn788	Max. Motor Speed Tuning	■	Address: 0x0788
Default: 0	Range: 0~2	Unit: 100rpm	Control mode: Ⓟ Ⓢ Ⓣ

Pn790※	Motor Code	○	Address: 0x0790
Default: by model	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Description	Used to set the motor type assigned to the drive, the specific code setting value is based on the motor nameplate only for photoelectric incremental encoder motors. ● Serial encoder motor (factory value): 0x1000. When this function code is set to 0x1000, the drive recognizes the encoder type by itself. Currently, only Nikon 24-bit encoders and Tamagawa 17-bit or 23-bit encoders are supported. At the same time, the drive will update the corresponding recognized encoder to function code Pn791. Note: When Pn790 is set to 0x1000, the Pn791 is invalid. ● Incremental encoder motor (set according to ID value) ● Custom serial encoder motor: 0x3000 When this function code is set to 0x3000, the drive performs serial communication processing based on the encoder specified by function code Pn791.

Pn791※	Encoder Control	○	Address: 0x0791
Default: by model	Range: 0x0000~0x000A	Unit: N/A	Control mode: P S T

Setting	0-th bit X	Encoder type	
		0	Non-complementary incremental encoder (2500 PPR)
		1	Complementary incremental encoder (2500 PPR)
		2	Tamagawa 17-bit absolute encoder
		3	Tamagawa 23-bit absolute encoder
		4	Nikon 20-bit single-turn encoder
		5	Nikon 20-bit multi-turn encoder
		6	Nikon 24-bit single-turn encoder
		7	Nikon 24-bit multi-turn encoder
		8	Serial incremental encoder (10000 lines)
	1-st bit Y	Reserved parameter (Do not use)	
	2-nd bit Z	Reserved parameter (Do not use)	
	3-rd bit W	Reserved parameter (Do not use)	
Description	Set the encoder type.		

Notes	
	● When using an absolute encoder, set the value in Pn790 [Motor Code] to 1000, and set Pn791 [Encoder Type] according to the actual encoder installed. ● When the value set in Pn790 indicates an incremental encoder, Pn791 setting is invalid and the encoder type is set automatically. ● Pn790 has the highest priority. The driver automatically determines the encoder type based on the value in Pn790.

Pn792※	Motor Zero Magnetic Pole Position	○	Address: 0x0792
Default: by model	Range: -360~360	Unit: °	Control mode: Ⓟ Ⓢ Ⓣ
Description	Set to display the reference position of the motor's zero pole. The auxiliary function Fn080 will update this after identification, and it is exclusively used for serial encoders.		

Pn793※	Position Sensor Resolution	■	Address: 0x0793★
Default: 10000	Range: $1\sim2^{31}$	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ
Description	Set the encoder resolution for customized motor parameters. For incremental encoders, the setting should be 4 times higher. Example: Incremental encoder is 2500 PPR, then the value of position sensor resolution is 10000.		

Pn795※	Incremental Encoder Control	○	Address: 0x0795
Default: 0x0000	Range: 0x0000~0x0111	Unit: N/A	Control mode: Ⓟ

Setting			
	0-th bit X	Hall WVU angle values	
		0	Internal factory values
		1	External Pn796~Pn79B values
	1-st bit Y	Encoder Z latch value	
		0	Internal factory values
		1	External Pn79C value
	2-nd bit Z	Incremental encoder resolution	
		0	Internal factory values
		1	External Pn793 value
	3-rd bit W	Reserved parameter (Do not use)	
Description	Set the encoder type.		

Pn796※	Angle Value (Incremental Encoder Hall WVU = 1 (001))	■	Address: 0x0796
Default: 240.0	Range: 0.0~359.9	Unit:	Control mode: Ⓟ Ⓢ Ⓣ

Pn797※	Angle Value (Incremental Encoder Hall WVU = 2 (010))	■	Address: 0x0797
Default: 0.0	Range: 0.0~359.9	Unit: °	Control mode: Ⓟ Ⓢ Ⓣ

Pn798※	Angle Value (Incremental Encoder Hall WVU = 3 (011))	■	Address: 0x0798
Default: 300.0	Range: 0.0~359.9	Unit: °	Control mode: Ⓟ Ⓢ Ⓣ

Pn799※	Angle Value (Incremental Encoder Hall WVU = 4 (100))	■	Address: 0x0799
Default: 120.0	Range: 0.0~359.9	Unit: °	Control mode: Ⓟ Ⓢ Ⓣ

Pn79A※	Angle Value (Incremental Encoder Hall WVU = 5 (101))	■	Address: 0x079A
Default: 180.0	Range: 0.0~359.9	Unit: °	Control mode: Ⓟ Ⓢ Ⓣ

Pn79B※	Angle Value (Incremental Encoder Hall WVU = 6 (110))	■	Address: 0x079B
Default: 60.0	Range: 0.0~359.9	Unit: °	Control mode: Ⓟ Ⓢ Ⓣ

Pn79C※	Incremental Encoder Z-Signal Angle Value	○	Address: 0x079C
Default: 330.0	Range: 0.0~359.9	Unit: °	Control mode: Ⓟ Ⓢ Ⓣ

Pn79E	Reserved	■	Address: 0x079E
Default: 0000	Range: 00000~65535	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

Pn79F	User Password	○	Address: 0x079F
Default: 0x0000	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: P S T

4.3.9 Motion Control Parameters (Pn8xx)

Pn800	Internal Position Reference	■	Address: 0x0800
Default: 0x0000	Range: 0x0000~0x0000	Unit: N/A	Control mode: P

Setting	0-th bit X	Internal position reference source	
		0	Internal Pr reference
	1-st bit Y	Reserved parameter (Do not use)	
	2-nd bit Z	Reserved parameter (Do not use)	
	3-rd bit W	Reserved parameter (Do not use)	

Pn802	Internal Pr Reference Mode	○	Address: 0x0802
Default: 0x0000	Range: 0x0000~0x1113	Unit: N/A	Control mode: P

Setting	0-th bit X	Internal position operation mode	
		0	Single segment (X terminal or communication)
		1	Single cycle and stop
		2	Cyclic
		3	Sequential
	1-st bit Y	Remaining path handling	
		0	Finish the remaining path
		1	Restart from path 1
	2-nd bit Z	Single-segment operation update	
		0	Non-immediate update
		1	Immediate update after communication reference
	3-rd bit W	Absolute position start	
		0	Post-homing motor position
		1	Pn296 [Absolute Zero Multi-turn Value] and Pn297 [Absolute Zero Single-turn Value]
Description	● When Pn802.Z=0, the DI or communication-based Pr commands are buffered until and the system finishes the current command, then the Pr commands are retrieved. ● When Pn802.Z=1, the communication-based Pr command is executed immediately.		

Pn803	Pr Reference End Path	○	Address: 0x0803
Default: 1	Range: 1~15	Unit: N/A	Control mode: P

Pn804	Sequential Pr Reference Start Path	○	Address: 0x0804
Default: 1	Range: 0~15	Unit: N/A	Control mode: P
Description	①The first round of sequential run starts at Pr1 and runs to the path indicated by Pn803; ②If Pn804=0 or Pn804 > Pn803, the sequence runs for 1 cycle and then stops. ③If Pn804≤Pn803, the first round is followed by cyclic operation, and the starts from Pn804; ④The enable signal CTRG is valid at high level.		

Pn806	Single Pr Reference Communication	○	Address: 0x0806
Default: 10000	Range: 0~65535	Unit: N/A	Control mode: P
Description	① When DI terminal switching is valid, input 1~15 to trigger the corresponding Pr path, and input 1000 to stop the current operation mode at once. ② When in position mode, input 0 to trigger home and input 1000 to stop homing at once.		

Pn810	Pr Reference-Path1 Control Word L	○	Address: 0x0810
Default: 0x0000	Range: 0x0000~0x0121	Unit: N/A	Control mode: P

Setting	0-th bit X	Pr reference type	
		0	Position control
		1	Constant-speed control
	1-st bit Y	Position control type	
		0	Incremental position
		1	Absolute position
		2	Relative position
	2-nd bit Z	Speed control unit	
		0	In 0.1rpm
		1	In PPS
	3-rd bit W	Reserved parameter (Do not use)	

Pn811	Pr Reference-Path 1 Control Word H	○	Address: 0x0811
Default: 0x0000	Range: 0x0000~0x7777	Unit: N/A	Control mode: P

Setting	0-th bit X	ACC time	
		0	Set the acceleration time via function codes Pn890~Pn89F.
		...	
		7	
	1-st bit Y	DEC time	
		0	Set the deceleration time via function codes Pn890~Pn89F.
		...	
		7	
	2-nd bit Z	Internal target speed	
		0	Set the internal target speed via function codes Pn8B0~Pn8BF.
		...	
		7	
	3-rd bit W	Delay time (pause)	
		0	Set the delay time via function codes Pn8A0~Pn8AF.
		...	
		7	

Pn812	PR1 Data	○	Address: 0x0812★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: N/A	Control mode: P

Pn814	PR2 Control Word L	○	Address: 0x0814
Default: 0x0000	Range: 0x0000~0x0121	Unit: N/A	Control mode: P

Pn815	PR2 Control Word H	○	Address: 0x0815
Default: 0x0000	Range: 0x0000~0x7777	Unit: N/A	Control mode: P

Pn816	PR2 Data	○	Address: 0x0816★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: N/A	Control mode: P

Pn818	PR3 Control Word L	○	Address: 0x0818
Default: 0x0000	Range: 0x0000~0x0121	Unit: N/A	Control mode:Ⓟ

Pn819	PR3 Control Word H	○	Address: 0x0819
Default: 0x0000	Range: 0x0000~0x7777	Unit: N/A	Control mode:Ⓟ

Pn81A	PR3 Data	○	Address: 0x081A★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: N/A	Control mode:Ⓟ

Pn81C	PR4 Control Word L	○	Address: 0x081C
Default: 0x0000	Range: 0x0000~0x0121	Unit: N/A	Control mode:Ⓟ

Pn81D	PR4 Control Word H	○	Address: 0x081D
Default: 0x0000	Range: 0x0000~0x7777	Unit: N/A	Control mode:Ⓟ

Pn81E	PR4 Data	○	Address: 0x081E★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: N/A	Control mode:Ⓟ

Pn820	PR5 Control Word L	○	Address: 0x0820
Default: 0x0000	Range: 0x0000~0x0121	Unit: N/A	Control mode:Ⓟ

Pn821	PR5 Control Word H	○	Address: 0x0821
Default: 0x0000	Range: 0x0000~0x7777	Unit: N/A	Control mode:Ⓟ

Pn822	PR5 Data	○	Address: 0x0822★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: N/A	Control mode:Ⓟ

Pn824	PR6 Control Word L	○	Address: 0x0824
Default: 0x0000	Range: 0x0000~0x0121	Unit: N/A	Control mode:Ⓟ

Pn825	PR6 Control Word H	○	Address: 0x0825
Default: 0x0000	Range: 0x0000~0x7777	Unit: N/A	Control mode:Ⓟ

Pn826	PR6 Data	○	Address: 0x0826★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: N/A	Control mode:Ⓟ

Pn828	PR7 Control Word L	○	Address: 0x0828
Default: 0x0000	Range: 0x0000~0x0121	Unit: N/A	Control mode:Ⓟ

Pn829	PR7 Control Word H	○	Address: 0x0829
Default: 0x0000	Range: 0x0000~0x7777	Unit: N/A	Control mode:Ⓟ

Pn82A	PR7 Data	○	Address: 0x082A★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: N/A	Control mode:Ⓟ

Pn82C	PR8 Control Word L	○	Address: 0x082C
Default: 0x0000	Range: 0x0000~0x0121	Unit: N/A	Control mode:Ⓟ

Pn82D	PR8 Control Word H	○	Address: 0x082D
Default: 0x0000	Range: 0x0000~0x7777	Unit: N/A	Control mode:Ⓟ

Pn82E	PR8 Data	○	Address: 0x082E★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: N/A	Control mode:Ⓟ

Pn830	PR9 Control Word L	○	Address: 0x0830
Default: 0x0000	Range: 0x0000~0x0121	Unit: N/A	Control mode:Ⓟ

Pn831	PR9 Control Word H	○	Address: 0x0831
Default: 0x0000	Range: 0x0000~0x7777	Unit: N/A	Control mode:Ⓟ

Pn832	PR9 Data	○	Address: 0x0832★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: N/A	Control mode:Ⓟ

Pn834	PR10 Control Word L	○	Address: 0x0834
Default: 0x0000	Range: 0x0000~0x0121	Unit: N/A	Control mode:Ⓟ

Pn835	PR10 Control Word H	○	Address: 0x0835
Default: 0x0000	Range: 0x0000~0x7777	Unit: N/A	Control mode:Ⓟ

Pn836	PR10 Data	○	Address: 0x0836★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: N/A	Control mode:Ⓟ

Pn838	PR11 Control Word L	○	Address: 0x0838
Default: 0x0000	Range: 0x0000~0x0121	Unit: N/A	Control mode:Ⓟ

Pn839	PR11 Control Word H	○	Address: 0x0839
Default: 0x0000	Range: 0x0000~0x7777	Unit: N/A	Control mode:Ⓟ

Pn83A	PR11 Data	○	Address: 0x083A★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: N/A	Control mode:Ⓟ

Pn83C	PR12 Control Word L	○	Address: 0x083C
Default: 0x0000	Range: 0x0000~0x0121	Unit: N/A	Control mode:Ⓟ

Pn83D	PR12 Control Word H	○	Address: 0x083D
Default: 0x0000	Range: 0x0000~0x7777	Unit: N/A	Control mode:Ⓟ

Pn83E	PR12 Data	○	Address: 0x083E★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: N/A	Control mode:Ⓟ

Pn840	PR13 Control Word L	○	Address: 0x0840
Default: 0x0000	Range: 0x0000~0x0121	Unit: N/A	Control mode:Ⓟ

Pn841	PR13 Control Word H	○	Address: 0x0841
Default: 0x0000	Range: 0x0000~0x7777	Unit: N/A	Control mode:Ⓟ

Pn842	PR13 Data	○	Address: 0x0842★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: N/A	Control mode:Ⓟ

Pn844	PR14 Control Word L	○	Address: 0x0844
Default: 0x0000	Range: 0x0000~0x0121	Unit: N/A	Control mode:Ⓟ

Pn845	PR14 Control Word H	○	Address: 0x0845
Default: 0x0000	Range: 0x0000~0x7777	Unit: N/A	Control mode:Ⓟ

Pn846	PR14 Data	○	Address: 0x0846★
Default: 0	Range: -2^{31}~2^{31}-1	Unit: N/A	Control mode:Ⓟ

Pn848	PR15 Control Word L	○	Address: 0x0848
Default: 0x0000	Range: 0x0000~0x0121	Unit: N/A	Control mode:Ⓟ

Pn849	PR15 Control Word H	○	Address: 0x0849
Default: 0x0000	Range: 0x0000~0x7777	Unit: N/A	Control mode:Ⓟ

Pn890	ACC/DEC Time 0	○	Address: 0x0890
Default: 30	Range: 0~65500	Unit: ms	Control mode:Ⓟ
Description	Set the Pr reference acceleration and deceleration time between 0rpm~3000rpm, the same below.		

Pn891	ACC/DEC Time 1	○	Address: 0x0891
Default: 50	Range: 0~65500	Unit: ms	Control mode:Ⓟ

Pn892	ACC/DEC Time 2	○	Address: 0x0892
Default: 200	Range: 0~65500	Unit: ms	Control mode:P

Pn893	ACC/DEC Time 3	○	Address: 0x0893
Default: 300	Range: 0~65500	Unit: ms	Control mode:P

Pn894	ACC/DEC Time 4	○	Address: 0x0894
Default: 500	Range: 0~65500	Unit: ms	Control mode:P

Pn895	ACC/DEC Time 5	○	Address: 0x0895
Default: 600	Range: 0~65500	Unit: ms	Control mode:P

Pn896	ACC/DEC Time 6	○	Address: 0x0896
Default: 800	Range: 0~65500	Unit: ms	Control mode:P

Pn897	ACC/DEC Time 7	○	Address: 0x0897
Default: 900	Range: 0~65500	Unit: ms	Control mode:P

Pn898	Pr Reference-Delay Time 0	○	Address: 0x0898
Default: 0	Range: 0~60000	Unit: ms	Control mode:P
Description	Set the delay time after a Pr reference is finished, the same below.		

Pn899	Pr Reference-Delay Time 1	○	Address: 0x0897
Default: 100	Range: 0~60000	Unit: ms	Control mode:P

Pn89A	Pr Reference-Delay Time 2	○	Address: 0x089A
Default: 200	Range: 0~60000	Unit: ms	Control mode:P

Pn89B	Pr Reference-Delay Time 3	○	Address: 0x089B
Default: 400	Range: 0~60000	Unit: ms	Control mode:P

Pn89C	Pr Reference-Delay Time 4	○	Address: 0x089C
Default: 500	Range: 0~60000	Unit: ms	Control mode:P

Pn89D	Pr Reference-Delay Time 5	○	Address: 0x089D
Default: 800	Range: 0~60000	Unit: ms	Control mode:P

Pn89E	Pr Reference-Delay Time 6	○	Address: 0x089E
Default: 1000	Range: 0~60000	Unit: ms	Control mode:P

Pn89F	Pr Reference-Delay Time 7	○	Address: 0x089F
Default: 1500	Range: 0~60000	Unit: ms	Control mode:P

Pn8A0	Internal Target Velocity 0	○	Address: 0x08A0
Default: 20.0	Range: 0.0~6000.0	Unit: rpm	Control mode:P
Description	Set the speed target in PR mode, the same below.		

Pn8A2	Internal Target Velocity 2	○	Address: 0x08A2
Default: 100.0	Range: 0.0~6000.0	Unit: rpm	Control mode:P

Pn8A3	Internal Target Velocity 3	○	Address: 0x08A3
Default: 200.0	Range: 0.0~6000.0	Unit: rpm	Control mode:P

Pn8A4	Internal Target Velocity 4	○	Address: 0x08A4
Default: 300.0	Range: 0.0~6000.0	Unit: rpm	Control mode:P

Pn8A5	Internal Target Velocity 5	○	Address: 0x08A5
Default: 500.0	Range: 0.0~6000.0	Unit: rpm	Control mode:P

Pn8A6	Internal Target Velocity 6	○	Address: 0x08A6
Default: 600.0	Range: 0.0~6000.0	Unit: rpm	Control mode:P

Pn8A7	Internal Target Velocity 7	○	Address: 0x08A7
Default: 800.0	Range: 0.0~6000.0	Unit: rpm	Control mode: P

4.3.10 Drive Parameters(PnExx)

PnE00☆	Servo Drive Model	■	Address: 0x0E00
Default: by model	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: P S T

Description: Set the servo drive model and repower it up to take effect.

Setpoint	Servo Drive Code	Comment
0x0001	SD100-110A	Rated current 11A, main circuit power: DC 48V
0x0002	SD100-210A	Rated current 21A, main circuit power: DC 48V

PnE01☆	Servo Drive Power	■	Address: 0x0E01
Default: by model	Range: 0~65535	Unit: W	Control mode: P S T

PnE02☆	Servo Drive Voltage	■	Address: 0x0E02
Default: by model	Range: 0x0000~0x0004	Unit: N/A	Control mode: P S T

Setting

	Servo drive voltage	
0-th bit X	0	AC 100V (reserved)
	1	AC 220V
	2	AC 380V
	3	DC 24V
	4	DC 48V
1-st bit Y	Reserved parameter (Do not change)	
2-nd bit Z	Reserved parameter (Do not change)	
3-rd bit W	Reserved parameter (Do not change)	

PnE03☆	Servo Drive Rated Current	■	Address: 0x0E03
Default: by model	Range: 0.0~6553.5	Unit: A	Control mode: P S T

PnE04☆	Servo Drive Peak Current	■	Address: 0x0E04
Default: by model	Range: 0.0~6553.5	Unit: A	Control mode: Ⓟ Ⓢ Ⓣ

PnE05☆	Drive Module Overheat Error Level	■	Address: 0x0E05
Default: by model	Range: 60.0~100.0	Unit: ℃	Control mode: Ⓟ Ⓢ Ⓣ
Description	Set the threshold for the drive module overheat error. When its actual temperature is greater than this setting, the drive will report a module overheat error		

PnE06☆	Drive Overload Current Level	■	Address: 0x0E06
Default: by model	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

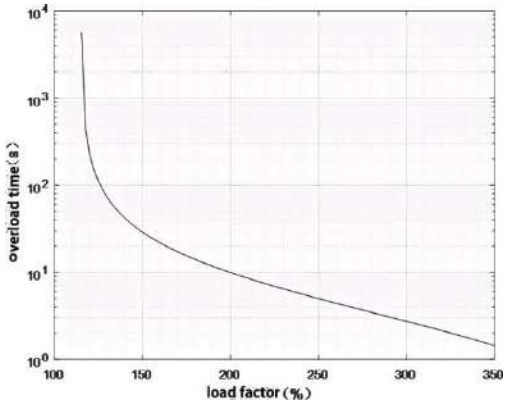
Setting			
	0-th bit 1-st bit X Y	Base overload current	
		00	Range: 0~255, unit: 1%
		...	
		FF	
	2-nd bit 3-rd bit Z W	Intermediate overload current	
		00	Range: 0~255, unit: 10%
		...	
		FF	

PnE07☆	Drive Overload Time Level	■	Address: 0x0E07
Default: by model	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: P S T

Setting			
	0-th bit 1-st bit X Y	Drive overload intermediate time	
		00	Range: 0~255, unit: 1s
		...	
		FF	
	2-nd bit Z 3-rd bit W	Drive overload maximum time	
		00	Range: 0~255, unit: 1s
		...	
		FF	

Description

Set the time threshold for the drive to trigger an overload protection.



PnE08☆	Drive Overload Time Tuning	■	Address: 0x0E08
Default: by model	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: P S T

Setting			
	0-th bit 1-st bit X Y	Intermediate time calibration	
		00	Range: 0~255, unit: 1%
		...	
		FF	
	2-nd bit 3-rd bit Z W	Max. time calibration	
		00	Range: 0~255, unit: 1%
		…	
		FF	

<table>
<tr><td>PnE09☆</td><td colspan="2">Motor Overload Time Tuning</td><td>■</td><td>Address: 0x0E09</td></tr>
<tr><td colspan="2">Default: by model</td><td>Range: 0x0000~0xFFFF</td><td>Unit: N/A</td><td>Control mode: P S T</td></tr>
<tr><td rowspan="6">Setting</td><td rowspan="3">0-th bit 1-st bit
X Y</td><td colspan="3">Intermediate time calibration</td></tr>
<tr><td>00</td><td rowspan="3" colspan="2">Range: 0~255, unit: 1%</td></tr>
<tr><td>…</td></tr>
<tr><td>FF</td></tr>
<tr><td rowspan="3">2-nd bit3-rd bit
Z W</td><td colspan="3">Max. time calibration</td></tr>
<tr><td>00</td><td rowspan="3" colspan="2">Range: 0~255, unit: 1%</td></tr>
<tr><td>…</td></tr>
<tr><td>FF</td></tr>
</table>

<table>
<tr><td>PnE0A☆</td><td colspan="2">Low 8 bits (L): Reserved
High 8 bits (H): Motor Overspeed Level Tuning</td><td>■</td><td>Address: 0x0E0A</td></tr>
<tr><td colspan="2">Default: by model</td><td>Range: 0x0000~0xFFFF</td><td>Unit: N/A</td><td>Control mode: P S T</td></tr>
<tr><td rowspan="6">Setting</td><td rowspan="2">0-th bit 1-st bit
X Y</td><td colspan="3">Reserved parameter (Do not use)</td></tr>
<tr><td colspan="3">Motor overspeed level calibration</td></tr>
<tr><td rowspan="4">2-nd bit 3-rd bit
Z W</td><td>00</td><td rowspan="4" colspan="2">Range: 0~255, and the overspeed level calibration is calculated as follows:
Overspeed level=PnE0A.WZ*PnF06.YX</td></tr>
<tr><td>…</td></tr>
<tr><td>FF</td></tr>
<tr><td colspan="3"></td></tr>
</table>

<table>
<tr><td>PnE0B☆</td><td colspan="2">Built-in Rege Braking Resistance</td><td>■</td><td>Address: 0x0E0B</td></tr>
<tr><td colspan="2">Default: by model</td><td>Range: 0~65535</td><td>Unit: Ω</td><td>Control mode: P S T</td></tr>
</table>

<table>
<tr><td>PnE0C☆</td><td colspan="2">Built-in Rege Braking Resistor Capacity</td><td>■</td><td>Address: 0x0E0C</td></tr>
<tr><td colspan="2">Default: by model</td><td>Range: 0.0~6553.5</td><td>Unit: %</td><td>Control mode: P S T</td></tr>
</table>

PnE10☆	P-N Voltage Detection Level (Max. Detectable Hardware Voltage)	■	Address: 0x0E10
Default: by model	Range: 0~1000	Unit: V	Control mode: Ⓟ Ⓢ Ⓣ
Description	Set the rated value for bus voltage detection, which is adjusted based on the hardware. For DC48V models, set it to 123V. Note: Do not modify this parameter without manufacturer approval, or it may cause irreversible damage to the machine!		

PnE11☆	DC Bus Voltage Detection Filter Time	■	Address: 0x0E11
Default: 0	Range: 0~10000	Unit: us	Control mode: Ⓟ Ⓢ Ⓣ

PnE12☆	DC Bus Voltage Zero Calibration	○	Address: 0x0E12
Default: factory setting	Range: -50~50	Unit: V	Control mode: Ⓟ Ⓢ Ⓣ

PnE13☆	DC Bus Voltage Gain Calibration	○	Address: 0x0E13
Default: 0	Range: -127~127	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ
Description	Set the linearity of busbar voltage detection. $U_{dc} \times \frac{256+PnE13}{256}$ Note: Do not modify this parameter without manufacturer approval, or it may cause irreversible damage to the machine!		

PnE14☆	Main Circuit Filter Switch	■	Address: 0x0E14
Default: 0x0055	Range: 0x0000~0x7777	Unit: N/A	Control mode: P S T

Setting	0-th bit X	Voltage error filter	
		0	Range: 0~7, unit: 250μs
		…	
		7	
	1-st bit Y	Overvoltage error filter	
		0	Range: 0~7, unit: 250μs
		…	
		7	
	2-nd bit Z	Regen braking filter start	
		0	Range: 0~7, unit: 250μs
		…	
		7	
	3-rd bit W	Regen braking filter end	
		0	Range: 0~7, unit: 250μs

PnE15☆	Error Prompt 1	■	Address: 0x0E15
Default: 0x0000	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: P

Setting	0-th bit X	System switch A	
		Bit0	Reserved
		Bit1	Motor-to-drive capacity 4× detection (0:ON;1:OFF)
		Bit2	Motor and drive overload detection (0:ON;1:OFF)
		Bit3	ER.860 (ABS encoder overheat) detection (0:ON;1:OFF)
	1-st bit Y	System switch B	
		Bit4	EtherCAT mode supported by drive detection (0: OFF;1: ON)
		Bit5	FPGA backup program operation detection (0:ON;1:OFF)
		Bit6	Non-standard CANopen lifespan detection (0:ON;1:OFF)
		Bit3	Reserved
	2-nd bit Z	Reserved parameter (Do not use)	
		Bit7	FPGA backup program operation detection (0:ON;1:OFF)
		Bit8	MicroChip ESC manual mode (0:9253;1:9252)
		Bit9	MicroChip ESC mode (0: Auto;1: Manual)
		Bit10	Reserved
	3-rd bit W	Reserved parameter (Do not use)	

PnE17☆	Single-IGBT Protection & Bootstrap Charging Time	■	Address: 0x0E17
Default: by model	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: P S T

Setting	0-th bit 1-st bit X Y	Rated speed
		Range: 0~255 Unit: 1ms
	2-nd bit 3-rd bit Z W	Max. speed
		Range: 0~255 Unit: 1ms

PnE1C☆	System Switch 2	■	Address: 0x0E1C
Default: 0x0003	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: P

Setting	0-th bit X	System switch 2A	
		Bit0	Regen braking protection (0:OFF;1:ON)
		Bit1	Phase compensation (0: ON; 1: OFF)
		Bit2	DB brake protection (0:ON;1:OFF)
		Bit3	ESC manufacturer (0:MicroChip;1:Beckoff)
	1-st bit Y	System switch 2B	
		Bit4	ER.C91 (Encoder acceleration error) (0:ON;1:OFF)
		Bit5	ER.C92 (Incremental encoder Z signal loss error) (0:ON;1:OFF)
		Bit6	FPGA-to-ARM watchdog error (0:ON;1:OFF)
		Bit7	EtherCAT model auto-detection (0:ON; 1:OFF)
	2-nd bit Z	System switch 2C	
		Bit8	ACR work mode (0: Mode 1; 1: Mode 2)
		Bit9	Current feedback mode (0: Mode 0; 1: Mode 1)
		Bit10	Silent mode (0:OFF; 1:ON)
		Bit11	Manual bootstrap charge (0:ON;1:OFF)
	3-rd bit W	System switch 2D	
		Bit12	Bootstrap mode (0:ON;1:OFF)
		Bit13	Current sensor IC 0: C796/NSI1306, 1: AM1305)
		Bit14	Power rating detection (0:ON; 1:OFF)
		Bit15	Auto-identification enable for current sampling chip in single-IGBT models

PnE1D☆	System Switch 3	■	Address: 0x0E1D
Default: 0000	Range: 0x0000~0x0001	Unit: N/A	Control mode: P

Setting	0-th bit X	System switch 3A	
		0	Allow writing function-code parameters
		1	Prohibit writing function-code parameters
	1-st bit Y	Reserved parameter (Do not use)	
	2-nd bit Z	Reserved parameter (Do not use)	
	3-rd bit W	Reserved parameter (Do not use)	

PnE1E☆	Max. Consecutive Serial Communication Failures	■	Address: 0x0E1E
Default: by model	Range: 0x0000~0x00FF	Unit: N/A	Control mode: P S T

Setting	0-th bit 1-st bit X Y	Max. consecutive serial communication failures	
		00	Range: 0~255, unit: times
		…	
		FF	
	2-nd bit Z 3-rd bit W	Reserved parameter (Do not use)	
Description	Set the number of consecutive communication failures between the drive and the serial encoder, and it reports ER.C90 when actual count is higher than this setting.		

PnE1F☆	Silent Mode Filter Time	■	Address: 0x0E1F
Default: by model	Range: 1~65535	Unit: us	Control mode: P S T

PnE20☆	ACR Gain (D-axis)	■	Address: 0x0E20
Default: by model	Range: 100~10000	Unit: Hz	Control mode: P S T

PnE21☆	ACR Gain (Q-axis)	■	Address: 0x0E21
Default: by model	Range: 100~10000	Unit: Hz	Control mode: Ⓟ Ⓢ Ⓣ

PnE22☆	ACR Integral Time (D-axis)	■	Address: 0x0E22
Default: by model	Range: 0~65535	Unit: us	Control mode: Ⓟ Ⓢ Ⓣ

PnE23☆	ACR Integral Time (Q-axis)	■	Address: 0x0E23
Default: by model	Range: 0~65535	Unit: us	Control mode: Ⓟ Ⓢ Ⓣ

PnE24☆	ACR Integral Limit (D-axis)	■	Address: 0x0E24
Default: 10430	Range: 0~65535	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

PnE25☆	ACR Integral Limit (Q-axis)	■	Address: 0x0E25
Default: 10430	Range: 0~65535	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ

PnE28☆	Current Detection Gain 1	■	Address: 0x0E28
Default: by model	Range: 0~16384	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ
Description	Set the hardware current-detection coefficient of the drive. PnE28 = (current-sense resistor (mΩ) × drive maximum current PnE03 (peak, 0.1 A unit)) ÷ ADC full-scale voltage (320 mV) × 8192. $\text{PnE28} = \frac{\text{Current Sense Resistor Value (m}\Omega\text{)} \times \text{Drive Peak Current PnE15 (0.1 A)}}{\text{ADC Full} - \text{scale Voltage (320 mV)}} \times$ Note: Do not modify this parameter without manufacturer approval, or it may cause irreversible damage to the machine!		

PnE29☆	Voltage Compensation Gain	■	Address: 0x0E29
Default: 115	Range: 0~300	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ
Description	Set the gain for voltage compensation.		

PnE2A☆	Carrier Frequency	■	Address: 0x0E2A
Default: by model	Range: 2000~16000	Unit: HZ	Control mode: Ⓟ Ⓢ Ⓣ
Description	Set the carrier (PWM) frequency of the servo drive.		

PnE2B☆	Deadband Compensation Gain/Time	■	Address: 0x0E2B
Default: by model	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: P S T

Setting			
	0-th bit 1-st bit X Y	Deadtime	
		00 … FF	Range: 1.6~6.0, unit: 0.1us
	2-nd bit Z 3-rd bit W	Deadtime compensation gain	
		00 … FF	Range: 0~100, unit: 1%

PnE2C☆	Current Detection Gain 1	■	Address: 0x0E2C
Default: by model	Range: 0.00~100.00	Unit: N/A	Control mode: P S T

PnE2D☆	Current Detection Gain 2	■	Address: 0x0E2D
Default: by model	Range: 0~16384	Unit: N/A	Control mode: P S T

PnE30☆	Max. Drive Overvoltage Level	■	Address: 0x0E30
Default: by model	Range: 0~1000	Unit: V	Control mode: P S T
Description	Set the max. overvoltage of the servo drive allowed.		

PnE31☆	Min. Drive Overvoltage Level	■	Address: 0x0E31
Default: by model	Range: 0~1000	Unit: V	Control mode: P S T
Description	Set the min. overvoltage of the servo drive allowed.		

<table>
<tr><td>PnE32☆</td><td colspan="2">Drive Overcurrent Protection Filter Time</td><td>■</td><td>Address: 0x0E32</td></tr>
<tr><td>Default: by model</td><td colspan="2">Range: 0x0000~0xFFFF</td><td>Unit: NA</td><td>Control mode: P S T</td></tr>
<tr><td rowspan="6">Setting</td><td rowspan="4">0-th bit 1-st bit
X Y</td><td colspan="3">Drive overcurrent protection filter time</td></tr>
<tr><td>00</td><td colspan="2" rowspan="3">Range: 0~255, unit: 1.6μs</td></tr>
<tr><td>…</td></tr>
<tr><td>FF</td></tr>
<tr><td rowspan="4">2-nd bit
Z
3-rd bit
W</td><td colspan="3">External hardware overcurrent signal filter time</td></tr>
<tr><td>00</td><td colspan="2" rowspan="3">Range: 0~255, unit: 1μs</td></tr>
<tr><td>…</td></tr>
<tr><td>FF</td></tr>
</table>

<table>
<tr><td>PnE33☆</td><td colspan="2">Drive Overcurrent Protection Level</td><td>■</td><td>Address: 0x0E33</td></tr>
<tr><td>Default: by model</td><td colspan="2">Range: 0.0~6553.5</td><td>Unit: A</td><td>Control mode: P S T</td></tr>
<tr><td>Description</td><td colspan="4">Set the hardware overcurrent thresholds of the drive for different models. Do not change the parameter without the manufacturer's permission, or it may cause irreversible damage to the machine!</td></tr>
</table>

<table>
<tr><td>PnE35☆</td><td colspan="2">PWM Frequency Upper Limit</td><td>■</td><td>Address: 0x0E34</td></tr>
<tr><td>Default: by model</td><td colspan="2">Range: 3000~16000</td><td>Unit: Hz</td><td>Control mode: P S T</td></tr>
<tr><td>Description</td><td colspan="4">Set the upper limit for the drive PWM frequency.</td></tr>
</table>

PnEA8☆	2nd Speed Feedback Filter Time	■	Address: 0x0EA8
Default: by model	Range: 0.02~655.35	Unit: ms	Control mode: Ⓟ Ⓢ Ⓣ

4.3.11 Motor Parameters (PnFxx)

PnF00☆	Encoder Type & Motor Voltage		■	Address: 0x0F00
Default: by model	Range: 0x0000~0x22FF		Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ
Setting	0-th bit 1-st bit X Y	Reserved parameter (Do not use)		
	2-nd bit Z	Motor voltage		
		0	Reserved	
		3	DC 24V	
		4	DC 48V	
	3-rd bit W	Encoder type		
		1	Multi-turn absolute encoder	
		2	Incremental encoder or single-turn absolute encoder	

PnF02☆	Motor Power	■	Address: 0x0F02
Default: by model	Range: 0~65535	Unit: W	Control mode: Ⓟ Ⓢ Ⓣ

PnF03☆	Encoder Bit/Resolution	■	Address: 0x0F03
Default: by model	Range: 0x0000~0x00FF	Unit: N/A	Control mode: Ⓟ Ⓢ Ⓣ
Setting	0-th bit 1-st bit X Y	Encoder bit 0x01: 2500 PPR 0x11: 17 bits 0x17: 23 bits	
	2-nd bit Z 3-rd bit W	Reserved parameter (Do not use)	

PnF05☆	Max. Velocity & Rated Velocity	■	Address: 0x0F05
Default: by model	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: P S T

Setting	0-th bit 1-st bit X Y	Rated speed Range: 0~255 Unit: 100rpm Incremental encoder
	2-nd bit Z 3-rd bit W	Max. speed Range: 0~255 Unit: 100rpm

PnF06☆	Motor Poles & Overspeed Level	■	Address: 0x0F06
Default: by model	Range: 0x0000~0xFF32	Unit: N/A	Control mode: P S T

Setting	0-th bit 1-st bit X Y	Overspeed detection threshold Range: 0x00~0x32 Unit: % Incremental encoder	
	2-nd bit Z 3-rd bit W	Motor poles	
		06	6-pole motor (3 pole pairs)
		08	8-pole motor (4 pole pairs)
		0A	10-pole motor (5 pole pairs)

PnF07☆	Rated Torque	■	Address: 0x0F07
Default: by model	Range: 0.00~655.35	Unit: Nm	Control mode: P S T

PnF08☆	Max. Torque	■	Address: 0x0F08
Default: by model	Range: 0~65535	Unit: %	Control mode: P S T

PnF09☆	Motor Rated Current (Peak)	■	Address: 0x0F09
Default: by model	Range: 0.0~6553.5	Unit: A	Control mode: P S T

PnF0A☆	Motor Max. Instantaneous Current (Peak)	■	Address: 0x0F0A
Default: by model	Range: 0.0~6553.5	Unit: A	Control mode: Ⓟ Ⓢ Ⓣ

PnF0B☆	Back-EMF (RMS)	■	Address: 0x0F0B
Default: by model	Range: 0.0~6553.5	Unit: mV/rpm	Control mode: Ⓟ Ⓢ Ⓣ

PnF0C☆	Motor Rotor Inertia	■	Address: 0x0F0C
Default: by model	Range: 0~65535	Unit: $10kgm^2$	Control mode: Ⓟ Ⓢ Ⓣ

PF0D☆	Motor Stator Resistance (Line Resistance R)	■	Address: 0x0F0D
Default: by model	Range: 0.000~65.535	Unit: Ω	Control mode: Ⓟ Ⓢ Ⓣ

PF0E☆	Motor Inductance (Line Inductance)	■	Address: 0x0F0E
Default: by model	Range: 0.00~655.35	Unit: mH	Control mode: Ⓟ Ⓢ Ⓣ

PnF0F☆	Motor Overload Base Current	■	Address: 0x0F0F
Default: by model	Range: 0~65535	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ

PnF10☆	Motor Overload Intermediate Current	■	Address: 0x0F10
Default: by model	Range: 0~65535	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ

PnF11☆	Motor Overload Intermediate Current Duration	■	Address: 0x0F11
Default: by model	Range: 0~65535	Unit: 10S	Control mode: Ⓟ Ⓢ Ⓣ

PnF12☆	Max. Motor Overload Current	■	Address: 0x0F12
Default: by model	Range: 0~65535	Unit: %	Control mode: Ⓟ Ⓢ Ⓣ

PnF13☆	Max. Motor Overload Current Duration	■	Address: 0x0F13
Default: by model	Range: 0~65535	Unit: S	Control mode: Ⓟ Ⓢ Ⓣ

PnF15☆	Rotary Motor Type & Encoder Manufacturer	■	Address: 0x0F15
Default: 0000	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: P S T

Setting	0-th bit X	Encoder manufacturer	
		0	No distinction
		1	NK
		2	DMC
		3	RY
	1-st bit Y	Rotary motor type	
		0	Surface permanent magnet (SPM)
		1	Interior permanent magnet (IPM)
	2-nd bit Z	Reserved parameter (Do not use)	
	3-rd bit W	Reserved parameter (Do not use)	

PF16☆	Salient-Pole Motor Inductance Lq	■	Address: 0x0F16
Default: by model	Range: 0.00~655.35	Unit: mH	Control mode: P S T

PF17☆	Salient-Pole Motor Inductance Ld	■	Address: 0x0F17
Default: by model	Range: 0.00~655.35	Unit: mH	Control mode: P S T

PnF18☆	Rotor Inertia/Rated Torque Exponent Unit	■	Address: 0x0F18
Default: by model	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: P S T

Setting	0-th bit 1-st bit X Y	Rated torque exponent unit	
		n	Range: -128~127, 10^n
	2-nd bit Z 3-rd bit W	Rotor inertia exponent unit	
		n	Range: -128~127, 10^n

PnF19☆	Velocity/Power Exponent Unit	■	Address: 0x0F19
Default: by model	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: P S T

Setting			
0-th bit 1-st bit X Y	Power exponent unit		
	n	10^n	
2-nd bit 3-rd bit Z W	Speed exponent unit		
	n	10^n	

PnF1B☆	Motor Magnetic-Pole Start Position	■	Address: 0x0F1B
Default: by model	Range: -360~360	Unit: deg	Control mode: P S T

PnF1E☆	Related Flag Bits (FLAG)	■	Address: 0x0110
Default: by model	Range: 0x0000~0xFFFF	Unit: N/A	Control mode: P S T

Setting			
0-th bit X	Flag bit switch 1		
	Bit0	Reserved	
	Bit1	Reserved	
	Bit2	Velocity feedback 2nd filter enable (0:OFF;1: ON)	
	Bit3	Reserved	
1-st bit Y	Flag bit switch 2		
	Bit4	Reserved	
	Bit5	Reserved	
	Bit6	Reserved	
	Bit7	Reserved	
2-nd bit Z	Reserved parameter (Do not change)		
3-rd bit W	Reserved parameter (Do not change)		

4.4 Un Parameter Overview

The monitor display function starts with Un for displaying the status of input and output signals and related information of the servo drive.

Code	Description	Unit	Data Type	Address
Un000	Motor Feedback Velocity	rpm	int16	0xE000
Un001	Velocity Reference	rpm	int16	0xE001
Un002	Internal Torque Reference	%	int16	0xE002
Un004	Electrical Angle (from Magnetic Pole Origin)	deg	uint16	0xE004
Un005	Reference Pulse Velocity (Position Mode)	rpm	int16	0xE005
Un006	Reference Pulse Counter	Reference unit	int32	0xE006
Un007	Encoder Pulse Counter 1	Reference unit	int32	0xE007
Un008	Encoder Pulse Counter 2	Encoder unit	int32	0xE008
Un009	Position Deviation (Position Mode)	User unit	int32	0xE009
Un00A	Accumulated Load Ratio (100% of rated torque, 10s-cycle RMS)	%	uint16	0xE00A
Un00B	Regen Load Rate (100% of handleable regenerative energy, 10s-cycle regeneration power consumption)	%	uint16	0xE00B
Un00D	Effective Gain Monitoring (1: Gain 1 2: Gain 2)	-	uint16	0xE00D
Un00E	Total Drive Power-on Time	0.1s	uint32	0xE00E
Un00F	Port Input Signal Monitoring	-	uint16	0xE00F
Un010	Absolute Encoder Single-turn Value	Encoder unit	uint32	0xE010
Un011	Absolute Encoder Multi-turn Value	rev	int16	0xE011
Un017	Encoder Z Signal Output Count	-	int32	0xE017
Un018	Encoder Z Signal One-way Output Count	-	int32	0xE018
Un02A	Internal Control Status 1	-	uint16	0xE02A
Un02B	Internal Control Status (Input Terminal) 2	-	uint16	0xE02B
Un02C	Internal Control Status (Input Terminal) 3	-	uint16	0xE02C
Un02D	Internal Control Status (Output Terminal) 4	-	uint16	0xE02D
Un02E	CAN Status		uint16	0xE02E
Un02F	CAN Command Word		uint16	0xE02F
Un030	Servo Operation Status	-	uint16	0xE030
Un031	CANopen Operation Status	-	uint16	0xE031
Un035	MCU Main Version No.	-	uint16	0xE035
Un036	FPGA Main Version No.	-	uint16	0xE036
Un037	MCU Sub Version No.	-	uint16	0xE037
Un038	FPGA Sub Version No.	-	uint16	0xE038
Un087	Serial Encoder Communication Error Counter	times	uint16	0xE087
Un089	Module Temp.	0.1℃	uint16	0xE089
Un100	Input Signal Monitoring	-	uint16	0xE100
Un101	Output Signal Monitoring	-	uint16	0xE101
Un105	Position Tuning Time	0.1ms	uint16	0xE105

Un106	Position Overshoot	Reference unit	uint16	0xE106
Un10B	KTY Sensor Detection	1℃	uint16	0xE10B
Un10D	Internal Chip Temp. (ambient)	0.1℃	uint16	0xE10D
Un140	Bus Voltage	1V	uint16	0xE140
Un141	Current Detection Value (RMS)	0.1A	uint16	0xE141
Un142	Accumulated Load Ratio (100% of rated torque, 2ms-cycle RMS)	0.1%	uint16	0xE142
Un143	Accumulated Regenerative Load	0.1%	uint16	0xE143
Un144	Accumulated DB Load	%	uint16	0xE144
Un203	Error Parameter Funcode (Er.040)	-	uint16	0xE203
Un212	System Time Monitoring A (Avg)	0.1us	uint16	0xE212
Un213	System Time Monitoring A (Max)	0.1us	uint16	0xE213
Un214	System Time Monitoring B (Avg)	0.1us	uint16	0xE214
Un215	System Time Monitoring B (Max)	0.1us	uint16	0xE215
Un216	System Time Monitoring C (Avg)	0.1us	uint16	0xE216
Un217	System Time Monitoring C (Max)	0.1us	uint16	0xE217
Un218	System Time Monitoring R (Avg)	0.01ms	uint16	0xE218
Un219	System Time Monitoring R (Max)	0.01ms	uint16	0xE219
Un511	U-phase Current Offset	-	int16	0xE511
Un512	V-phase Current Offset	-	int16	0xE512
Un513	**Hardware** Version Code	-	int16	0xE513
Un603	Absolute Encoder Pulse [low 32-bit]	Encoder unit	uint32	0xE603
Un605	Absolute Encoder Pulse [high 32-bit]	Encoder unit	uint32	0xE605
Un607	Mechanical Absolute Position [low 32-bit]	Encoder unit	uint32	0xE607
Un609	Mechanical Absolute Position [high 32-bit]	Encoder unit	uint32	0xE609
Un800	Current Error/Alarm Code	-	uint16	0xE800
Un801	Alarm Code	-	uint16	0xE801
Un802	Alarm Timestamp	100ms	uint32	0xE802
Un803	Error-Motor Velocity	rpm	int16	0xE803
Un804	Error-Velocity Reference	rpm	int16	0xE804
Un805	Error-Internal Torque Reference	%	int16	0xE805
Un806	Error-Input Pulse Velocity	rpm	int16	0xE806
Un807	Error-Position Deviation	pulse	int32	0xE807
Un808	Error-DC Bus Voltage	V	uint16	0xE808
Un809	Error-Current Feedback RMS	A	int16	0xE809
Un80A	Error-Cumulative Load Rate [2ms]	%	uint16	0xE80A
Un80B	Error-Regenerative Load Rate [2ms]	%	uint16	0xE80B
Un80C	Error-DB Resistor Power Consumption [2ms]	%	uint16	0xE80C
Un80D	Error-Max. Cumulative Load Rate	%	uint16	0xE80D
Un80E	Error-Moment of Inertia Ratio	%	uint16	0xE80E
Un80F	Error-Serial Encoder Communication Exception Count	-	uint16	0xE80F
Un810	Error-Internal Signal Monitor	-	uint32	0xE810
Un814	Error-Internal Input Signal Monitor	-	uint32	0xE814
Un818	Error-Internal Output Signal Monitor	-	uint32	0xE818
Un820	Error History 0	-	uint16	0xE820

Un821	Error History 1	-	uint16	0xE821
Un822	Error History 2	-	uint16	0xE822
Un823	Error History 3	-	uint16	0xE823
Un824	Error History 4	-	uint16	0xE824
Un825	Error History 5	-	uint16	0xE825
Un826	Error History 6	-	uint16	0xE826
Un827	Error History 7	-	uint16	0xE827
Un828	Error History 8	-	uint16	0xE828
Un829	Error History 9	-	uint16	0xE829
Un830	Error History 0 Occurrence Time	0.1s	uint32	0xE830
Un832	Error History 1 Occurrence Time	0.1s	uint32	0xE832
Un834	Error History 2 Occurrence Time	0.1s	uint32	0xE834
Un836	Error History 3 Occurrence Time	0.1s	uint32	0xE836
Un838	Error History 4 Occurrence Time	0.1s	uint32	0xE838
Un83A	Error History 5 Occurrence Time	0.1s	uint32	0xE83A
Un83C	Error History 6 Occurrence Time	0.1s	uint32	0xE83C
Un83E	Error History 7 Occurrence Time	0.1s	uint32	0xE83E
Un840	Error History 8 Occurrence Time	0.1s	uint32	0xE840
Un842	Error History 9 Occurrence Time	0.1s	uint32	0xE842

Note:

The data type definitions marked ① in the above table are described as follows.

Data Type	Description
int16	Signed word (16-bit)
uint16	Unsigned word (16-bit)
int32	Signed double word (32-bit)
uint32	Unsigned double word (32-bit)

② The monitored function code Un00E may have an actual deviation of ±1 hour.

5 Communication Description

5.1 Object Dictionary

5.1.1 Object Property

Terminology

“Index”: Specifies the position of each object in the object dictionary, expressed in hexadecimal (h).

“Data Type”: See Table 9-28.

Table 9-28 Data Type Description

Data Type	Range	Length	DS301 Value
Int8	-128~127	1 byte	2
Uint8	0~255	1 byte	5
Int16	-32768~+32767	2 bytes	3
Uint16	0~65535	2 bytes	6
Int32	-2147483648~+2147483647	4 bytes	4
Uint32	0~4294967295	4 bytes	7
String	ASCII	-	9

“R/W”: See Table 9-29.

Table 9-29 Read/Write Type Description

R/W	Description
RW	Read/Write
WO	Write only
RO	Read-only
CONST	Constant, read only

“Object Structure”: See Table 9-30.

Table 9-30 Object Structure Description

Object Structure	Description	DS301 Value
VAR	Clean values containing the data types in Table 3-1	7
ARR	Array of elements of the same type	8
REC	Record composed of elements of different types	9

5.1.2 1000h Object List

Index	Subindex	Name	Object Structure	Data Type	R/W	Mapping
1000h	-	Device Type	VAR	Uint16	RO	N
1001h	-	Error Register	VAR	Uint8	RO	N
1003h	-	Predefined Error Field	ARR	Uint32	RO	N
	00h	Number of Errors	VAR	Uint8	RW	N
	01~04h	Standard Error Field	VAR	Uint32	RO	N
1005h	-	COB-ID SYNC Message	VAR	Uint32	RW	N
1006h	-	Communication Cycle Period	VAR	Uint32	RW	N
100Ch	-	Guard Time	VAR	Uint16	RW	N
100Dh	-	Life Time Factor	VAR	Uint8	RW	N
1010h	-	Store Parameters	ARR	Uint32	RW	N
	00h	Max Supported Sub-index	VAR	Uint8	RO	N
	02h	Store All Object Parameters	VAR	Uint16	RW	N
1011h	-	Restore Default Parameters	ARR	Uint32	RW	N
	00h	Max Supported Sub-index	VAR	Uint8	RO	N
	02h	Restore All Default Parameters	VAR	Uint16	RW	N
1014h	-	COB-ID Emergency Message	VAR	Uint32	RW	N
1016h	-	Consumer Heartbeat Time	ARR	-	-	-
	00h	Largest Sub-index Supported	VAR	Uint8	RO	N
	01h	Consumer Heartbeat Time	VAR	Uint32	RW	N
1017h	-	Producer Heartbeat Time	VAR	Uint16	RW	N
1018h	-	Device Object Description	REC	-	-	-
	00h	Largest Sub-index Supported	VAR	Uint8	RO	N
	01h	Manufacturer ID	VAR	Uint16	RO	N
	02h	Device Code	VAR	Uint16	RO	N
	03h	Revision Number	VAR	Uint16	RO	N
1029h	-	Error Behavior	ARR	-	-	-
	00h	Largest Sub-index Supported	VAR	Uint8	RO	N
	01h	Communication Error	VAR	Uint8	RW	N

1200h	-	SDO Server Parameter	ARR	-	-	-
	00h	Largest Sub-index Supported	VAR	Uint8	RO	N
	01h	COB-ID Client → Server (rx)	VAR	Uint32	RW	N
	02h	COB-ID Server → Client (tx)	VAR	Uint32	RW	N
1400h	-	RPDO1 Mapping Parameter	REC	-	-	-
	00h	Largest Sub-index Supported	VAR	Uint8	RO	N
	01h	COB-ID Used by RPDO1	VAR	Uint32	RW	N
	02h	RPDO1 Reception Type	VAR	Uint8	RW	N
1401h	-	RPDO2 Mapping Parameter	REC	-	-	-
	00h	Largest Sub-index Supported	VAR	Uint8	RO	N
	01h	COB-ID Used by RPDO2	VAR	Uint32	RW	N
	02h	RPDO2 Reception Type	VAR	Uint8	RW	N
1402h	-	RPDO3 Mapping Parameter	REC	-	-	-
	00h	Largest Sub-index Supported	VAR	Uint8	RO	N
	01h	COB-ID Used by RPDO3	VAR	Uint32	RW	N
	02h	RPDO3 Reception Type	VAR	Uint8	RW	N
1403h	-	RPDO4 Mapping Parameter	REC	-	-	-
	00h	Largest Sub-index Supported	VAR	Uint8	RO	N
	01h	COB-ID Used by RPDO4	VAR	Uint32	RW	N
	02h	RPDO4 Reception Type	VAR	Uint8	RW	N
1600h	-	RPDO1 Mapping Parameter	REC	-	-	-
	00h	Number of Mapped Application Objects in RPDO1	VAR	Uint8	RW	N
	01h	RPDO1 Mapping Object 1	VAR	Uint32	RW	N
	02h	RPDO1 Mapping Object 2	VAR	Uint32	RW	N
	03h	RPDO1 Mapping Object 3	VAR	Uint32	RW	N
	04h	RPDO1 Mapping Object 4	VAR	Uint32	RW	N
1601h	-	RPDO2 Mapping Parameter	REC	-	-	-

	00h	Number of Mapped Application Objects in RPDO2	VAR	Uint8	RW	N
	01h	RPDO2 Mapping Object 1	VAR	Uint32	RW	N
	02h	RPDO2 Mapping Object 2	VAR	Uint32	RW	N
	03h	RPDO2 Mapping Object 3	VAR	Uint32	RW	N
	04h	RPDO2 Mapping Object 4	VAR	Uint32	RW	N
1602h	-	RPDO3 Mapping Parameter	REC	-	-	-
	00h	Number of Mapped Application Objects in RPDO3	VAR	Uint8	RW	N
	01h	RPDO3 Mapping Object 1	VAR	Uint32	RW	N
	02h	RPDO3 Mapping Object 2	VAR	Uint32	RW	N
	03h	RPDO3 Mapping Object 3	VAR	Uint32	RW	N
	04h	RPDO3 Mapping Object 4	VAR	Uint32	RW	N
1603h	-	RPDO4 Mapping Parameter	REC	-	-	-
	00h	Number of Mapped Application Objects in RPDO4	VAR	Uint8	RW	N
	01h	RPDO4 Mapping Object 1	VAR	Uint32	RW	N
	02h	RPDO4 Mapping Object 2	VAR	Uint32	RW	N
	03h	RPDO4 Mapping Object 3	VAR	Uint32	RW	N
	04h	RPDO4 Mapping Object 4	VAR	Uint32	RW	N
1800h	-	TPDO1 Parameter	REC	-	-	-
	00h	Largest Sub-index Supported	VAR	Uint8	RO	N
	01h	COB-ID Used by TPDO1	VAR	Uint32	RW	N
	02h	TPDO1 Transmission Type	VAR	Uint8	RW	N
	03h	Inhibit Time	VAR	Uint16	RW	N
	04h	NA	VAR	Uint8	RW	N
	05h	Event Timer	VAR	Uint16	RW	N

1801h	-	TPDO2 Parameter	REC	-	-	-
	00h	Largest Sub-index Supported	VAR	Uint8	RO	N
	01h	COB-ID Used by TPDO2	VAR	Uint32	RW	N
	02h	TPDO2 Transmission Type	VAR	Uint8	RW	N
	03h	Inhibit Time	VAR	Uint16	RW	N
	04h	NA	VAR	Uint8	RW	N
	05h	Event Timer	VAR	Uint16	RW	N
1802h	-	TPDO3 Parameter	REC	-	-	-
	00h	Largest Sub-index Supported	VAR	Uint8	RO	N
	01h	COB-ID Used by TPDO3	VAR	Uint32	RW	N
	02h	TPDO3 Transmission Type	VAR	Uint8	RW	N
	03h	Inhibit Time	VAR	Uint16	RW	N
	04h	NA	VAR	Uint8	RW	N
	05h	Event Timer	VAR	Uint16	RW	N
1803h	-	TPDO4 Parameter	REC	-	-	-
	00h	Largest Sub-index Supported	VAR	Uint8	RO	N
	01h	COB-ID Used by TPDO4	VAR	Uint32	RW	N
	02h	TPDO4 Transmission Type	VAR	Uint8	RW	N
	03h	Inhibit Time	VAR	Uint16	RW	N
	04h	NA	VAR	Uint8	RW	N
	05h	Event Timer	VAR	Uint16	RW	N
1A00h	-	TPDO1 Mapping Parameter	REC	-	-	-
	00h	Number of Mapped Application Objects in TPDO1	VAR	Uint8	RW	N
	01h	TPDO1 Mapping Object 1	VAR	Uint32	RW	N
	02h	TPDO1 Mapping Object 2	VAR	Uint32	RW	N
	03h	TPDO1 Mapping Object 3	VAR	Uint32	RW	N
	04h	TPDO1 Mapping Object 4	VAR	Uint32	RW	N
1A01h	-	TPDO4 Mapping Parameter	REC	-	-	-
	00h	Number of Mapped Application Objects in TPDO2	VAR	Uint8	RW	N
	01h	TPDO2 Mapping Object 1	VAR	Uint32	RW	N

	02h	TPDO2 Mapping Object 2	VAR	Uint32	RW	N
	03h	TPDO2 Mapping Object 3	VAR	Uint32	RW	N
	04h	TPDO2 Mapping Object 4	VAR	Uint32	RW	N
1A02h	-	TPDO3 Mapping Parameter	REC	-	-	-
	00h	Number of Mapped Application Objects in TPDO3	VAR	Uint8	RW	N
	01h	TPDO3 Mapping Object 1	VAR	Uint32	RW	N
	02h	TPDO3 Mapping Object 2	VAR	Uint32	RW	N
	03h	TPDO3 Mapping Object 3	VAR	Uint32	RW	N
	04h	TPDO3 Mapping Object 4	VAR	Uint32	RW	N
1A03h	-	TPDO4 Mapping Parameter	REC	-	-	-
	00h	Number of Mapped Application Objects in TPDO4	VAR	Uint8	RW	N
	01h	TPDO4 Mapping Object 1	VAR	Uint32	RW	N
	02h	TPDO4 Mapping Object 2	VAR	Uint32	RW	N
	03h	TPDO4 Mapping Object 3	VAR	Uint32	RW	N
	04h	TPDO4 Mapping Object 4	VAR	Uint32	RW	N

5.1.3 2000h Object List

The Group 2000h object dictionary provides a mapping to the drive's internal parameters, among which, 2000h~2006h correspond to parameter groups Pn0xx to Pn6xx, respectively, and 2E00h~2E08h correspond to the monitoring parameters Un0xx to Un8xx. The specific function codes of the drive correspond to the subindexes within the Group 2000h object dictionary.

Index	Subindex	Description	Data Type	R/W	Mapping
2000h	-	Pn0xx Basic Parameters	-	-	-
	00h	Largest Sub-index Supported	Uint8	RO	N
	01h	Pn000: Function Selection Switch 0	Uint16	RW	N
	02h	Pn001: Function Selection Switch 1	Uint16	RW	N
	03h	Pn002: Motor Direction	Uint16	RW	N
	…	…	…	RW	N

	82h	Pn081: Local Communication Format	Uint16	RW	N
	86h	Pn085: Communication Modification Power-down Save	Uint16	RW	N
2001h	-	Pn1xx Gain Parameters	-	-	N
	00h	Largest Sub-index Supported	Uint8	RO	N
	01h	Pn100: Moment of Inertia Ratio	Uint16	RW	N
	02h	Pn101: ASR Proportional Gain	Uint16	RW	N
	…	…	…	RW	N
	94h	Pn193: Max. Advanced Tuning Gain	Uint16	RW	N
2002h	-	Pn2xx Position Parameters	-	-	N
	00h	Largest Sub-index Supported	Uint8	RO	N
	01h	Pn200: Position Reference Source	Uint16	RW	N
	02h	Pn201: Pulse Reference Logic	Uint16	RW	N
	03h	Pn202: Position Control Function Switch 1	Uint16	RW	N
	04h	Pn203: Pulse Reference Multiplier	Uint16	RW	N
	…	…	…	RW	N
	98h	Pn297: Absolute Zero Single-turn Value	Uint16	RW	N
	9Ah	Pn299: Home Timeout	Uint16	RW	N
2003h	-	Pn3xx Speed Parameters	-	-	N
	00h	Largest Sub-index Supported	Uint8	RO	N
	01h	Pn300: Velocity Reference Source	Int16	RW	N
	02h	Pn301: Velocity Reference Direction	Int16	RW	N
	…	…	…	RW	N
	21h	Pn320: /V-CMP Signal Width	Uint16	RW	N
2004h	-	Pn4xx Torque Parameters	-	-	N
	00h	Largest Sub-index Supported	Uint8	RO	N
	01h	Pn400: Torque Control 1	Uint16	RW	N
	02h	Pn401: Torque Command 2nd Low-pass Filter OFF Frequency	Uint16	RW	N
	…	…	…	RW	N
	31h	Pn430: Torque Control 2	Uint16	RW	N
2005h	-	Pn5xx Auxiliary Parameters	-	-	N
	00h	Largest Sub-index Supported	Uint8	RO	N
	01h	Pn500: JOG Speed	Uint16	RW	N
	02h	Pn502: Program JOG Operation Mode	Uint16	RW	N
	…	…	…	RW	N
	09h	Pn508: Program JOG Move Speed	Uint16	RW	N
2006h	-	Pn6xx Terminal Parameters	-	-	N
	00h	Largest Sub-index Supported	Uint8	RO	N
	01h	Pn600: X Terminal Filter Time	Uint16	RW	N
	02h	Pn601: X1 Terminal Configuration	Uint16	RW	N

	…	…	…	RW	N
	31h	Pn630: Internal Setting on X Terminal	Uint16	RW	N
2E00h	-	Un0xx Monitoring Parameters	-	-	N
	00h	Largest Sub-index Supported	Uint8	RO	N
	01h	Un000: Motor Feedback Velocity	Int16	RO	N
	02h	Un001: Reference Velocity	Int16	RO	N
	…	…	…	RO	N
	38h	Un038: MCU Sub Version No.	Uint16	RO	N
	39h	Un039: FPGA Version (Sub-version)	Uint16	RO	N
2E01h	-	Un1xx Monitoring Parameters	-	-	N
	00h	Largest Sub-index Supported	Uint8	RO	N
	01h	Un100: Input Signal Monitoring	Uint16	RO	N
	02h	Un101: Output Signal Monitoring	Uint16	RO	N
	06h	Un105: Position Tuning Time	Uint16	RO	N
	…	…	…	RO	N
	45h	Un144: Accumulated DB Load	Uint16	RO	N
2E02h	-	Un2xx Monitoring Parameters	-	-	N
	00h	Largest Sub-index Supported	Uint8	RO	N
	04h	Un203: Error Parameter Funcode (Er.040)	Uint16	RO	N
	13h	Un212: System Time Monitoring A (Avg)	Uint16	RO	N
	…	…	…	RO	N
	1Ah	Un219: System Time Monitoring R (Max)	Uint16	RO	N
2E05h	-	Un5xx Monitoring Parameters	-	-	N
	00h	Largest Sub-index Supported	Uint8	RO	N
	12h	Un511: U-phase Zero Crossing	Uint16	RO	N
	13h	Un512: V-phase Zero Crossing	Uint16	RO	N
2E06h	-	Un6xx Monitoring Parameters	-	-	N
	00h	Largest Sub-index Supported	Uint8	RO	N
	04h	Un603: Absolute Encoder Pulse [low 32-bit]	Uint32	RO	N
	06h	Un605: Absolute Encoder Pulse [high 32-bit]	Uint32	RO	N
2E08h	-	Un8xx Monitoring Parameters	-	-	N
	00h	Largest Sub-index Supported	Uint8	RO	N
	01h	Un800: Current Error/Alarm Code	Uint16	RO	N
	02h	Un801: Alarm Code	Uint16	RO	N
	…	…	…	RO	N
	43h	Un842: Error History 9 Occurrence Time	Uint32	RO	N

The table below shows the correspondence between 2000h group object indexes and drive function codes.

Caution	
	● The last two digits of the function code correspond to the sub-index. Both the function code and sub-index are hexadecimal values. Example: When reading from or writing to function code Pn299, the corresponding object dictionary entry is 2002h:9Ah.

5.1.4 6000h Object List

The CANopen6000h groups object dictionary assignment is shown in the table below:

Index	Subindex	Name	R/W	Mapping	Data Type	Unit	Range
603Fh	00h	Error Code	RO	Y	UINT16	-	UINT16
6040h	00h	Control Word	RW	Y	UINT16	-	UINT16
6041h	00h	Status Word	RO	Y	UINT16	-	UINT16
605Ah	00h	Quick Stop Mode	RW	Y	UINT16	-	UINT16
605Dh	00h	Halt Stop Mode	RW	Y	UINT16	-	UINT16
6060h	00h	Operation Mode	RW	Y	INT8	-	INT8
6061h	00h	Operation Mode Display	RO	Y	INT8	-	INT8
6062h	00h	Position Demand Value	RO	Y	INT32	Reference unit	INT32
6063h	00h	Motor Position Feedback	RO	Y	INT32	Encoder unit	INT32
6064h	00h	Position Actual Value	RO	Y	INT32	Reference unit	INT32
6065h	00h	Position Deviation Error Level	RW	Y	UINT32	Reference unit	UINT32
6067h	00h	/COIN Signal Width	RW	Y	UINT32	Reference unit	UINT32
6068h	00h	/COIN Signal Time	RW	Y	UINT16	0.1ms	UINT16
606Bh	00h	Velocity Demand Value	RO	Y	INT32	Reference unit/s	INT32
606Ch	00h	Velocity Actual Value	RO	Y	INT32	Reference unit/s	INT32
606Dh	00h	/V-CMP Signal Width	RW	Y	UINT16	0.1rpm	UINT16
606Eh	00h	/V-CMP Signal Time	RW	Y	UINT16	ms	UINT16
606Fh	00h	Zero-velocity Reach Level	RW	Y	UINT16	0.1rpm	UINT16
6070h	00h	Zero-velocity Reach Time	RW	Y	UINT16	ms	UINT16
6071h	00h	Target Torque	RW	Y	INT16	0.1%	INT16
6072h	00h	Max. Torque	RW	Y	UINT16	0.1%	UINT16

6074h	00h	Torque Demand Value	RO	Y	INT16	0.1%	INT16
6075h	00h	Motor Rated Current	RO	Y	UINT32	mA	UINT32
6076h	00h	Motor Rated Torque	RO	Y	UINT32	mNm	UINT32
6077h	00h	Motor Actual Torque	RO	Y	INT16	0.1%	INT16
6078h	00h	Current Actual Value	RO	Y	INT16	0.1%	INT16
607Ah	00h	Target Position	RW	Y	INT32	Reference unit	INT32
607Ch	00h	Home Offset	RW	Y	INT32	Reference unit	INT32
607Dh	01h	Min Position Limit	RW	Y	INT32	Reference unit	INT32
	02h	Max Position Limit	RW	Y	INT32	Reference unit	INT32
607F	00h	Max. Velocity Limit	RW	Y	UINT32	Reference unit/s	UINT32
6080h	00h	Max. Motor Velocity	RW	Y	UINT32	rpm	UINT32
6081h	00h	Profile Velocity	RW	Y	INT32	Reference unit/s	INT32
6083h	00h	Profile ACC	RW	Y	UINT32	Reference unit/s^2	UINT32
6084h	00h	Profile DEC	RW	Y	UINT32	Reference unit/s^2	UINT32
6085h	00h	Profile Emergency Stop DEC	RW	Y	UINT32	Reference unit/s^2	UINT32
6086h	00h	Motion Profile Type	RW	Y	INT16		INT16
6087h	00h	Torque Slope	RW	Y	UINT32	0.1%/s	UINT32
6091h	01h	Electronic Gear Numerator	RW	Y	UINT32	-	UINT32
	02h	Electronic Gear Denominator	RW	Y	UINT32	-	UINT32
6098h	00h	Home Mode	RW	Y	INT8	-	INT8
6099h	01h	Home Velocity (High)	RW	Y	UINT32	Reference unit/s	UINT32
	02h	Home Velocity (Low)	RW	Y	UINT32	Reference unit/s	UINT32
609Ah	00h	Home ACC/DEC	RW	Y	UINT32	Reference unit/s^2	UINT32
60C1h	01h	Absolute Interpolation Position	RW	Y	INT32	Reference unit/s^2	INT32
60C2h	01h	Interpolation Period	RW	Y	UINT8	-	UINT8

	02h	Interpolation Period Unit	RW	Y	INT8	-	INT8
60C5h	00h	Max. Profile ACC	RW	Y	UINT32	Reference unit/s^2	UINT32
60C6h	00h	Max. Profile DEC	RW	Y	UINT32	Reference unit/s^2	UINT32
60E0h	00h	Positive Torque Limit	RW	Y	UINT16	0.1%	UINT16
60E1h	00h	Negative Torque Limit	RW	Y	UINT16	0.1%	UINT16
60F4h	00h	User Position Deviation	RO	Y	INT32	Reference unit	INT32
60FCh	00h	Position Demand Value	RO	Y	INT32	Encoder unit	INT32
60FDh	00h	DI Status	RO	Y	UINT32	-	UINT32
60FEh	00h	Number of Entries	RO	N	UINT8	-	UINT8
	01h	DO Status	RO	Y	UINT32	-	UINT32
60FFh	00h	Target Velocity	RW	Y	INT32	Reference unit/s	INT32
6502h	00h	Supported Drive Modes	RO	Y	UINT16	-	UINT16

5.1.5 1000h Object Details

<table>
<tr><th colspan="6">1000h</th></tr>
<tr><td>Index</td><td>1000h</td><td colspan="4">-</td></tr>
<tr><td>Name</td><td colspan="5">Device Type</td></tr>
<tr><td>Object Structure</td><td>VAR</td><td>Data Type</td><td>Uint16</td><td>Range</td><td>Uint16</td></tr>
<tr><td>Mapping</td><td>NO</td><td>W/R</td><td>RO</td><td>Default</td><td>0x20192</td></tr>
<tr><td>Function Description</td><td colspan="5">It indicates the device subprotocol or application specification employed.
<table>
<tr><th>Bit</th><th>Name</th><th>Description</th></tr>
<tr><td>0~15</td><td>Device Sub-protocol</td><td>402(0x192): Device sub-protocol</td></tr>
<tr><td>16~23</td><td>Type</td><td>02: Servo drives</td></tr>
<tr><td>25~31</td><td>Mode</td><td>Manufacturer-defined</td></tr>
</table></td></tr>
</table>

<table>
<tr><th colspan="6">1001h</th></tr>
<tr><td>Index</td><td>1001h</td><td colspan="4">-</td></tr>
<tr><td>Name</td><td colspan="5">Error Register</td></tr>
<tr><td>Object Structure</td><td>VAR</td><td>Data Type</td><td>Uint8</td><td>Range</td><td>Uint8</td></tr>
<tr><td>Mapping</td><td>NO</td><td>W/R</td><td>RO</td><td>Default</td><td>0x0</td></tr>
<tr><td>Function Description</td><td colspan="5">It indicates the error information by bit as below:
<table>
<tr><th>Bit</th><th>Meaning</th><th>Bit</th><th>Meaning</th></tr>
<tr><td>0</td><td>General</td><td>4</td><td>Communication</td></tr>
<tr><td>1</td><td>Current</td><td>5</td><td>Sub-protocol</td></tr>
</table></td></tr>
</table>

		2	Voltage	6	NA
		3	Temperature	7	Manufacturer-defined
	When an error occurs, the corresponding bit is set to “1”, and whenever an error is present, bit0 must be “1”.				

1003h					
Index	1003h	-			
Name	Pro-defined Error Field				
Object Structure	ARR	Data Type	Uint32	Range	Uint32
Mapping	NO	W/R	RO	Default	-

Subindex	00h	-			
Name	Number of Errors				
Object Structure	-	Data Type	Uint8	Range	Uint8
Mapping	NO	W/R	RW	Default	0x0
Function Description	Write 0 only to clear all error records.				

Sub-index	1~4h	-			
Name	Standard Error Field				
Object Structure	-	Data Type	Uint32	Range	Uint32
Mapping	NO	W/R	RO	Default	0x0
Function Description	When the subindex is 0, it is unreadable; when an error occurs, the error is stored in the following format:				

MSB		LSB	
31	16	15	0
Manufacturer error code		Standard error code	

1005h					
Name	1005h				
Name	**COB-ID SYNC Message**				
Object Structure	VAR	Data Type	Uint32	Range	Uint32
Mapping	NO	W/R	RW	Default	0x80
Function Description	Only 0x80 and 0x40000080 are writable. ● Writing 0x80 deactivates the SYNC producer. ● Writing 0x40000080 activates the SYNC producer. Before activation, the Communication Cycle Period (1006h) must be configured as non-zero.				

1006h					
Index	1006h	-			
Name	**Communication Cycle Period**				
Object Structure	VAR	Data Type	Uint32	Range	Uint32
Mapping	NO	W/R	RW	Default	0x0
Function Description	Set the cycle time for the SYNC producer (unit: 125μs).				

1008h					
Index	1008h	-			
Name	Manufacturer Device Name				
Object Structure	REC	Data Type	Uint8	Range	-
Mapping	NO	W/R	RO	Default	Servo Device

100Ah					
Index	100Ah	-			
Name	Software Version				
Object Structure	REC	Data Type	Uint8	Range	-
Mapping	NO	W/R	RO	Default	Up to model

100Ch					
Index	100Ch	-			
Name	Guard Time				
Object Structure	VAR	Data Type	Uint16	Range	Uint16
Mapping	NO	W/R	RW	Default	0x0
Function Description	Applies only to the SYNC producer (unit: ms). Used with the Life Time Factor for node guarding.				

100Dh					
Index	100Dh	-			
Name	Life Time Factor				
Object Structure	VAR	Data Type	Uint8	Range	Uint8
Mapping	NO	W/R	RW	Default	0x0
Function Description	It must be greater than 1 when in use.				

<table>
<tr><td colspan="6">1010h</td></tr>
<tr><td>Index</td><td>1010h</td><td colspan="4">-</td></tr>
<tr><td>Name</td><td colspan="5">Store Parameters</td></tr>
<tr><td>Object Structure</td><td>ARR</td><td>Data Type</td><td>Uint32</td><td>Range</td><td>Uint32</td></tr>
<tr><td>Mapping</td><td>NO</td><td>W/R</td><td>RW</td><td>Default</td><td>0x0</td></tr>
<tr><td>Function Description</td><td colspan="5">

It saves the current parameter values to EEPROM. The next time the EEPROM is loaded (upon power cycling, node reset, or communication reset), these saved values will be loaded.
To store parameters, in addition to specifying the sub-index corresponding to the storage area, the ASCII characters "load" must be written, or any other value will not result in a successful save. The corresponding write values are as follows:

<table>
<tr><td>MSB</td><td></td><td></td><td></td><td>LSB</td></tr>
<tr><td>ASCII</td><td>E</td><td>v</td><td>a</td><td>s</td></tr>
<tr><td>Hex</td><td>65h</td><td>76</td><td>61h</td><td>73h</td></tr>
</table>
The corresponding subindex reading return value indicates how the subindex restores parameters to default. Return value format and meaning:
<table>
<tr><td>MSB</td><td></td><td></td><td>LSB</td></tr>
<tr><td>31</td><td>2</td><td>1</td><td>0</td></tr>
<tr><td colspan="2">NA</td><td>0/1</td><td>0/1</td></tr>
</table>
<table>
<tr><td>Value</td><td>Meaning</td></tr>
<tr><td>0</td><td>OFF, save parameter command invalid</td></tr>
<tr><td>1</td><td>OFF, save parameter command valid</td></tr>
<tr><td>2</td><td>ON, save parameter command invalid</td></tr>
<tr><td>3</td><td>ON, save parameter command valid</td></tr>
</table>
</td></tr>
</table>

1011h					
Index	1011h	-			
Name	Restore Default Parameters				
Object Structure	ARR	Data Type	Uint32	Range	-
Mapping	NO	W/R	RW	Default	-
Function Description	Restoring default parameters writes factory settings to EEPROM. This does not take effect immediately. Upon next EEPROM loading (after power cycling, node reset, or communication reset), the device loads default values (factory settings). To restore default parameters, specify the sub-index corresponding to the restore area, and write the ASCII string "load". Writing any other value will fail. The corresponding write values are as follows:				

MSB				LSB
ASCII	d	a	o	l
Hex	64h	61h	6Fh	6Ch

The corresponding subindex reading return value indicates how the subindex stores parameters. Return format and meaning:

MSB		LSB
31	1	0
NA		0/1

Value	Meaning
0	Parameters can’t be restore to default
1	Parameters can be restore to default

1014h					
Index	1014h	-			
Name	COB-ID Emergency Message				
Object Structure	VAR	Data Type	Uint32	Range	Uint32
Mapping	NO	W/R	RW	Default	0x80 + Node-ID
Function Description	Bit 31 = 0: Emergency (EMCY) function enabled (servo sends EMCY commands). Bit 31 = 1: Emergency (EMCY) function disabled (servo does not send EMCY commands).				

MSB			LSB
31	30 11	10	0
0/1	0x0	11-bit COB-ID	

When the emergency message is active, its COB-ID must match the value in this object.

1016h					
Index	1016h	-			
Name	Consumer Heartbeat Time				
Object Structure	ARR	Data Type	Uint32	Range	Uint32
Mapping	NO	W/R	RW	Default	-
Function Description	This includes the monitored node address and the actual consumer time. This time must be greater than the heartbeat producer time of the corresponding node (unit: ms). Two consumer times cannot be set for the same node. The parameter content is as follows:				
	MSB				LSB
	31 24		23 16		15 0
	NA		Monitored Address		Monitoring Time
	The corresponding subindex reading return value indicates how the subindex restores parameters to default.				

Subindex	00h	-			
Name	Number Entries				
Object Structure	-	Data Type	Uint8	Range	1
Mapping	NO	W/R	RO	Default	1
Function Description	This parameter can only be written as 0, which clears all error records.				

Sub-index	01h	-			
Name	Consumer Heartbeat Time				
Object Structure	-	Data Type	Uint32	Range	Uint32
Mapping	NO	W/R	RW	Default	0
Function Description	Save all the parameters in the object list.				

1017h					
Index	1017h	-			
Name	Producer Heartbeat Time				
Object Structure	VAR	Data Type	Uint16	Range	Uint16
Mapping	NO	W/R	RW	Default	-
Function Description	Unit: ms				

1018h					
Index	1018h	-			
Name	Producer Heartbeat Time				
Object Structure	REC	Data Type	Uint16	Range	-
Mapping	NO	W/R	RO	Default	-

Subindex	00h	-			
Name	Number of Entries				
Object Structure	-	Data Type	Uint8	Range	3
Mapping	NO	W/R	RO	Default	3

Subindex	01h	-			
Name	Vendor-ID				
Object Structure	-	Data Type	Uint16	Range	Uint16
Mapping	NO	W/R	RO	Default	0x3B9
Function Description	A unique number assigned by the CiA.				

Subindex	02h	-			
Name	Product Code				
Object Structure	-	Data Type	Uint16	Range	Uint16
Mapping	NO	W/R	RO	Default	-
Function Description	The device code corresponds to the product series and product model on the electronic label, and the correspondence is as follows:				
	MSB				LSB
	31	16	15		0
	Product Series		Product Model		

Subindex	03h	-			
Name	Revision Number				
Object Structure	-	Data Type	Uint16	Range	Uint16
Mapping	NO	W/R	RO	Default	-
Function Description	The specific meanings corresponding to the software version number 100Ah are as follows:				
	MSB				LSB
	31	16	15		0
	Major revision		Minor revision		

1029h	-	
Index	1029h	-
Name	Error Behavior	

Object Structure	ARR	Data Type	Uint8	Range	Uint8
Mapping	NO	W/R	RW	Default	-
Function Description	It defines the NMT state to which the CANopen communication shall automatically transition when different classes of errors occur based on the value set.				
	Value	Meaning			
	0	Transition to Pre-operational state when in Operational state			
	1	Remain in the current state			
	2	Transition to Stopped state			
	Others	NA			

Subindex	01h	-			
Name	Communication Error				
Object Structure	-	Data Type	Uint8	Range	Uint8
Mapping	NO	W/R	RW	Default	0
Function Description	It includes NMT guard timeout, PDO length error, and Bus-off condition.				

Subindex	00h	-			
Name	Largest Sub-index Supported				
Object Structure	-	Data Type	Uint8	Range	Uint8
Mapping	NO	W/R	RO	Default	1

Subindex	01h	-			
Name	Communication Error				
Object Structure	-	Data Type	Uint8	Range	Uint8
Mapping	NO	W/R	RW	Default	0
Function Description	It includes NMT guard timeout, PDO length error, and Bus-off condition.				

1200h					
Name	SDO Server Parameter				
Object Structure	REC	Data Type	-	Range	-
Mapping	NO	W/R	RO	Default	-
Function Description	MSB = 0: SDO valid; MSB = 1: SDO invalid. Default SDO always exists as a read-only constant.				
	MSB				LSB
	31	30	11	10	0
	0/1	0x0		11-bit COB-ID	

Subindex	00h	-			
Name	Number of Entries				
Object Structure	-	Data Type	Uint8	Range	Uint8
Mapping	NO	W/R	RO	Default	2

Subindex	01h	-			
Name	COB-ID Client → Server (rx)				
Object Structure	-	Data Type	Uint32	Range	Uint32
Mapping	NO	W/R	RW	Default	0x600 + Node-ID

Sub-index	02h	-			
Name	COB-ID Server → Client (tx)				
Object Structure	-	Data Type	Uint32	Range	Uint32
Mapping	NO	W/R	RW	Default	0x580 + Node-ID

1400h: RPDO1 Communication Parameter 1401h: RPDO2 Communication Parameter 1402h: RPDO3 Communication Parameter 1403h: RPDO4 Communication Parameter					
Index	1400h~1403h	-			
Name	RPDO Message COB-ID				
Object Structure	REC	Data Type	-	Range	-
Mapping	NO	W/R	RW	Default	-

Subindex	00h	-			
Name	Largest Sub-index Supported				
Object Structure	-	Data Type	Uint8	Range	0~2
Mapping	NO	W/R	RO	Default	2

Subindex	01h	-			
Name	COB-ID Used by RPDO				
Object Structure	-	Data Type	Uint32	Range	Uint32
Mapping	NO	W/R	RW	Default	See description below
Function Description	Only the MSB is modifiable: MSB = 0: PDO valid; MSB = 1: PDO invalid				
	MSB				LSB
	31	30	11	10	0
	0/1	0		11-bit COB-ID	
	Factory Settings (Default Node-ID = 1): 1400h: 0x80000200 + Node-ID 1401h: 0x80000300 + Node-ID 1402h: 0x80000400 + Node-ID 1403h: 0x80000500 + Node-ID				

Subindex	02h	-			
Name	RPDO Reception Type				
Object Structure	-	Data Type	Uint8	Range	Uint8
Mapping	NO	W/R	RW	Default	0
Function Description	This object can be modified only when PDO is invalid. Different values represent different PDO transmission types as shown in the table below:				

Value	Meaning
0	Synchronous, acyclic
1~240	Synchronous, cyclic
254~255	Asynchronous, acyclic

1600h: RPDO1 Mapping Parameter
1601h: RPDO2 Mapping Parameter
1602h: RPDO3 Mapping Parameter
1603h: RPDO4 Mapping Parameter

Subindex	1600h~1603h	-			
Name	RPDO Mapping Parameter				
Object Structure	REC	Data Type	-	Range	-
Mapping	NO	W/R	RW	Default	-
Function Description	This object can be modified only when PDO is invalid. The total bit length of the mapped object must not exceed 64 bits, and only byte-level mapping is supported, no bit-level mapping.				

Subindex	00h	-			
Name	Number of Mapped Application Objects in PDO				
Object Structure	-	Data Type	Uint8	Range	0~4
Mapping	NO	W/R	RW	Default	-
Function Description	Writing 0 invalidates all mapping sub-indexes.				

Subindex	1h~4h	-			
Name	PDO Mapping for the nth Application Object to be Mapped				
Object Structure	-	Data Type	Uint32	Range	Uint32
Mapping	NO	W/R	RW	Default	-
Function Description	The index and sub-index must exist in the object dictionary list, with writable and mappable attributes. Write the corresponding mapping object in the following format:				
	MSB				LSB
	31 16	15 8	7 0		
	Index	Subindex	Length		

Default RPDO Mapping Configuration:

(1) RPDO1 (1600h)

Sub-index	Value	Description
0	1	Map one entry
1	0x60400010	Control Word

(2) RPDO2 (1601h)

Sub-index	Value	Description
0	2	Map two entries
1	0x60400010	Control Word
2	0x60600008	Operation mode selection

(3) RPDO3 (1602h)

Sub-index	Value	Description
0	2	Map two entries
1	0x60400010	Control Word
2	0x607A0020	Target Position (Position Reference)

(4) RPDO4 (1603h)

Sub-index	Value	Description
0	2	Map two entries
1	0x60400010	Control Word
2	0x60FF0020	Target Velocity (Velocity Reference)

1800h: TPDO1 Communication Parameter 1801h: TPDO2 Communication Parameter 1802h: TPDO3 Communication Parameter 1803h: TPDO4 Communication Parameter					
Index	1800h~1803h				
Name	TPDO Communication Parameter				
Object Structure	REC	Data Type	-	Range	-
Mapping	NO	W/R	RW	Default	-

Subindex	00h	-			
Name	Largest Sub-index Supported				
Object Structure	-	Data Type	Uint8	Range	0~4
Mapping	NO	W/R	RO	Default	5

Subindex	01h	-			
Name	COB-ID Used by TPDO				
Object Structure	-	Data Type	Uint32	Range	Uint32
Mapping	NO	W/R	RW	Default	See description below
Function Description	Only the MSB is modifiable: MSB = 0: TPDO valid; MSB = 1: TPDO invalid				
	MSB				LSB
	31	30	11	10	0
	0/1	0		11-bit COB-ID	
	Factory Settings (Default Node-ID = 1): 1800h: 0x80000180 + Node-ID 1801h: 0x80000280 + Node-ID 1802h: 0x80000380 + Node-ID 1803h: 0x80000480 + Node-ID				

Subindex	02h	-			
Name	TPDO Transmission Type				
Object Structure	-	Data Type	Uint8	Range	Uint8
Mapping	NO	W/R	RW	Default	255
Function Description	This object can be modified only when PDO is invalid. Different values represent different PDO transmission types as shown in the table below:				
	Value	Meaning			
	0	Synchronous, acyclic			
	1~240	Synchronous, cyclic			
	255	Asynchronous, cyclic			

Subindex	03h	-			
Name	Inhibit Time				
Object Structure	-	Data Type	Uint16	Range	Uint16
Mapping	NO	W/R	RW	Default	8
Function Description	This object can be modified only when PDO is invalid. Unit: 125us. Note: A value of 0 disables Inhibit Time.				

Subindex	04h	-			
Name	Reserved				
Object Structure	-	Data Type	Uint8	Range	Uint8
Mapping	NO	W/R	RW	Default	0

Subindex	05h	-			
Name	**Event Timer**				
Object Structure	-	Data Type	Uint16	Range	Uint16
Mapping	NO	W/R	RW	Default	2
Function Description	This object can be modified only when PDO is invalid. Unit: 1ms. Note: A value of 0 disables **Event Timer**.				

1A00h: TPDO1 Mapping Parameter 1A01h: TPDO2 Mapping Parameter 1A02h: TPDO3 Mapping Parameter 1A03h: TPDO4 Mapping Parameter					
Index	1A00h~1A03h				
Name	TPDO Mapping Parameter				
Object Structure	REC	Data Type	-	Range	-
Mapping	NO	W/R	RW	Default	-
Function Description	This object can be modified only when PDO is invalid. The total bit length of the mapped object must not exceed 64 bits, and only byte-level mapping is supported, no bit-level mapping.				

Subindex	00h	-			
Name	Number of Mapped Application Objects in PDO				
Object Structure	-	Data Type	Uint8	Range	0~4
Mapping	NO	W/R	RW	Default	-
Function Description	Writing 0 invalidates all mapping sub-indexes.				

Subindex	1h~4h	-			
Name	TPDO Mapping Entry				
Object Structure	-	Data Type	Uint32	Range	Uint32

Mapping	NO	W/R	RW	Default	-
Function Description	The mapping object index and subindex must exist in the object dictionary list, be writable, and be mappable. Write the corresponding mapping object in the following format:				
	MSB				LSB
	31 16		15 8		7 0
	Index		Subindex		Length

TPDO default mapping contents are:

(1) TPDO1 (1A00h)

Sub-index	Value	Description
0	1	Map one entry
1	0x60410010	Status Word

(2) TPDO2 (1A01h)

Sub-index	Value	Description
0	2	Map two entries
1	0x60410010	Status Word
2	0x60610008	Current operation mode

(3) TPDO3 (1A02h)

Sub-index	Value	Description
0	2	Map two entries
1	0x60410010	Status Word
2	0x60640020	Current position

(4) TPDO4 (1A03h)

Sub-index	Value	Description
0	2	Map two entries
1	0x60410010	Status Word
2	0x606C0020	Current velocity

5.1.6 6000h Object Details

603Fh	-			PP	PV	PT	HM	IP
Index	603Fh	-						
Name	**Error Code**							
Object Structure	VAR	Data Type	Uint16	Range	0~65535			
Mapping	Y	W/R	RO	Default	-			
Function Description	It indicates the last error that occurred in the drive. See the error list for details.							

6040h	-		PP	PV	PT	HM	IP
Index	6040h	-					
Name	Control Word						

<table>
<tr><td>Object Structure</td><td>VAR</td><td>Data Type</td><td>Uint16</td><td>Range</td><td>0~65535</td></tr>
<tr><td>Mapping</td><td>Y</td><td>W/R</td><td>RW</td><td>Default</td><td>0</td></tr>
<tr><td>Function Description</td><td colspan="5">Bit definition of control word:
<table>
<tr><th>Bit</th><th>Meaning</th><th>Description</th></tr>
<tr><td>0</td><td>Servo ready</td><td>0: OFF 1: ON</td></tr>
<tr><td>1</td><td>Main circuit power on</td><td>0: OFF 1: ON</td></tr>
<tr><td>2</td><td>Quick stop</td><td>1: OFF 0: ON</td></tr>
<tr><td>3</td><td>Servo running</td><td>0: OFF 1: ON</td></tr>
<tr><td>4~6</td><td>Mode-dependent</td><td>
<table>
<tr><th rowspan="2">Bit</th><th colspan="4">Mode</th></tr>
<tr><th>PP</th><th>PV</th><th>PT</th><th>HM</th></tr>
<tr><td>4</td><td>New position rising edge trigger</td><td>NA</td><td>NA</td><td>Homing enable</td></tr>
<tr><td>5</td><td>0: Non-immediate update
1: Immediate update</td><td>NA</td><td>NA</td><td>NA</td></tr>
<tr><td>6</td><td>0: Absolute position
1: Relative position</td><td>NA</td><td>NA</td><td>NA</td></tr>
</table>
</td></tr>
<tr><td>7</td><td>Fault reset</td><td>Rising edge of bit7 is valid
If bit7 remains 1, other control commands are invalid</td></tr>
<tr><td>8</td><td>Halt</td><td>0: OFF 1: ON</td></tr>
<tr><td>9~10</td><td>NA</td><td>-</td></tr>
<tr><td>11~15</td><td>Manufacturer-defined</td><td>-</td></tr>
</table>
</td></tr>
</table>

6041h	-		PP	PV	PT	HM	IP
Index	6041h	-					
Name	Status Word						
Object Structure	VAR	Data Type	Uint16	Range	0~65535		
Mapping	Y	W/R	RO	Default	0		

<table>
<tr><td>Function Description</td><td>Reflects servo status:
<table>
<tr><th>Bit</th><th>Name</th><th>Description</th></tr>
<tr><td>0</td><td>Servo ready</td><td>1: ON 0: OFF</td></tr>
<tr><td>1</td><td>Wait for servo enable</td><td>1: ON 0: OFF</td></tr>
<tr><td>2</td><td>Servo running</td><td>1: ON 0: OFF</td></tr>
<tr><td>3</td><td>Error</td><td>0: No error; 1: Error</td></tr>
<tr><td>4</td><td>Main circuit power on</td><td>1: ON 0: OFF</td></tr>
<tr><td>5</td><td>Quick stop</td><td>0: ON 1: OFF</td></tr>
<tr><td>6</td><td>Power-on run enable</td><td>1: ON 0: OFF</td></tr>
<tr><td>7</td><td>Alarm</td><td>1: ON 0: OFF</td></tr>
<tr><td>8</td><td>Manufacturer-defined</td><td>-</td></tr>
<tr><td>9</td><td>Remote control</td><td>0: Non-CANopen mode
1: CANopen remote control mode</td></tr>
<tr><td>10</td><td>Target reached</td><td>Velocity mode
0: Target velocity not reached
1: Target velocity reached
Position mode
0: Target position not reached
1: Target position reached</td></tr>
<tr><td>11</td><td>Internal position limit</td><td>0: Reference/feedback below limit
1: Reference/feedback above limit</td></tr>
<tr><td>12~13</td><td>Operation mode-related</td><td>-</td></tr>
<tr><td>14</td><td>NA</td><td>-</td></tr>
<tr><td>15</td><td>Homing completed</td><td>0: Not performed or not completed
1: Homing completed, reference point found</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>605Ah</td><td colspan="4">-</td><td>PP</td><td>PV</td><td>PT</td><td>HM</td><td>IP</td></tr>
<tr><td>Index</td><td>605Ah</td><td colspan="8">-</td></tr>
<tr><td>Name</td><td colspan="9">Quick Stop Mode</td></tr>
<tr><td>Object Structure</td><td>VAR</td><td>Data Type</td><td colspan="2">Int16</td><td>Range</td><td colspan="4">0~2</td></tr>
<tr><td>Mapping</td><td>NO</td><td>W/R</td><td colspan="2">RW</td><td>Default</td><td colspan="4">2</td></tr>
<tr><td rowspan="4">Function Description</td><td>Display</td><td colspan="8">Control Mode</td></tr>
<tr><td>0</td><td colspan="8">Coast to stop and motor shaft not locked</td></tr>
<tr><td>1</td><td colspan="8">Stop by 0x6084 (0x609A during home) setting and motor shaft not locked</td></tr>
<tr><td>2</td><td colspan="8">Stop by 0x6085h setting and motor shaft not locked</td></tr>
</table>

605Dh			PP	PV	PT	HM	IP
Index	605Dh	-					
Name	Halt Stop Mode						

Object Structure	VAR	Data Type	Int16	Range	1~3
Mapping	NO	W/R	RW	Default	1

Function Description

Display	Control Mode
1	Stop by 6084h/6087h (0x609A during home) setting and motor shaft locked
2	Stop by 6085h/6087h setting and motor shaft locked
3	Stop as emergency stop and motor shaft locked

6060h	-		PP	PV	PT	HM	IP
Index	6060h	-					
Name	Operation Mode						
Object Structure	VAR	Data Type	Int8	Range	0~7		
Mapping	Y	W/R	RW	Default	1		

Function Description: Set the servo operation mode:

Setpoint	Description
0	NA
1	Profile Position mode (PP)
3	Profile Velocity mode (PV)
4	Profile Torque mode (PT)
6	Homing mode (HM)
7	Interpolated Position mode (IP)

6061h	-			PP	PV	PT	HM	IP
Index	6061h	-						
Name	Operation Mode Display							
Object Structure	VAR	Data Type	Int8	Range	0~7			
Mapping	Y	W/R	RO	Default	0			

Function Description

Setpoint	Control Mode
0	NA
1	Profile Position mode (PP)
3	Profile Velocity mode (PV)
4	Profile Torque mode (PT)
6	Homing mode (HM)
7	Interpolated Position mode (IP)

6062h	-			PP	HM	IP
Index	6062h	-				
Name	Position Demand Value					
Object Structure	VAR	Data Type	Int32	Range	-2^{31}~(2^{31}-1)	
Mapping	Y	W/R	RO	Default	0	
Function Description	It indicates the real-time position reference in user unit.					

6063h	-			PP	PV	PT	HM	IP
Index	6063h	-						
Name	User Position Feedback							
Object Structure	VAR	Data Type	Int32	Range	-2^{31}~(2^{31}-1)			
Mapping	Y	W/R	RO	Default	0			
Function Description	It indicates the actual position feedback value in encoder unit.							

6064h		PP	PV	PT	HM	IP
Index	6064h	-				
Name	Position Actual Value					
Object Structure	VAR	Data Type	Int32	Range	-2^{31}~(2^{31}-1)	
Mapping	Y	W/R	RO	Default	0	
Function Description	It indicates the actual position feedback value in user unit. User Position Feedback (6064h) × Gear Ratio (6091h) = Position Actual Value (6063h)					

6065h	-			PP	HM	IP
Index	6065h	-				
Name	Position Deviation Error Window					
Object Structure	VAR	Data Type	Uint32	Range	0~(2^{31}-1)	
Mapping	Y	W/R	RW	Default	3840000	
Function Description	Set the position deviation error level in reference unit. ● If the difference between the Position Demand Value (6062h) and Position Actual Value (6064h) exceeds ±6065h, an excessive position deviation error (ER.d00) occurs. ● When 6065h is set to 4294967295, the servo disables excessive position deviation monitoring.					

6067h	-			PP	HM	IP
Index	6067h	-				
Name	/COIN Signal Width					
Object Structure	VAR	Data Type	Uint32	Range	0~(2^{31}-1)	
Mapping	Y	W/R	RW	Default	100	

Function Description	Set the position arrival level in user unit. When the difference between the Position Demand Value (6062h) and Position Actual Value (6064h) is within ±6067h for the duration set in 6068h, the position is considered reached. In Profile Position mode, bit 10 of the Status Word (6041h) is set to 1.

6068h	-			PP	HM	IP
Index	6068h	-				
Name	/COIN Signal Time					
Object Structure	VAR	Data Type	Uint16	Range	0~65535	
Mapping	Y	W/R	RW	Default	0	
Function Description	Set the time range to judge if the position target is reached (unit: 1ms). When the difference between the Position Demand Value (6062h) and Position Actual Value (6064h) is within ±6067h for the duration set in 6068h, the position is considered reached. In Profile Position mode, bit 10 of the Status Word (6041h) is set to 1.					

606Bh			PP	PV	PT	HM	IP
Index	606Bh	-					
Name	Velocity Demand Value						
Object Structure	VAR	Data Type	Int32	Range	-2^{31}~$(2^{31}-1)$		
Mapping	Y	W/R	RO	Default	-		
Function Description	It indicates the actual position feedback value (unit: 0.1rpm). ● In position mode, it reflects the speed reference corresponding to the output of the position regulator, ● while it indicates the input reference of the speed regulator in velocity mode.						

606Ch	-			PP	PV	PT	HM	IP
Index	606Ch	-						
Name	Velocity Actual Value							
Object Structure	VAR	Data Type	Int32	Range	-2^{31}~ $(2^{31}-1)$			
Mapping	Y	W/R	RO	Default	-			
Function Description	It indicates the actual velocity feedback value (unit: user unit/s).							

606Dh	-				PV
Index	606Dh	-			
Name	V-CMP Signal Width				
Object Structure	VAR	Data Type	Uint16	Range	0~65535
Mapping	Y	W/R	RW	Default	100

Function Description	Set the speed window threshold (unit : 0.1rpm). When the difference between the Target Velocity (60FFh) and the Velocity Actual Value (606Ch) remains within ±606Dh for the duration set in 606Eh, the velocity is considered reached. In Profile Velocity mode, bit 10 of the Status Word (6041h) is set to 1. Otherwise, bit 10 of Status Word (6041h) is set to 0.

606Eh	-				PV
Index	606Eh	-			
Name	/V-CMP Signal Time				
Object Structure	VAR	Data Type	Uint16	Range	0~65535
Mapping	Y	W/R	RW	Default	0
Function Description	Set the time range to judge if the velocity target is reached (unit: ms). When the difference between the Target Velocity (60FFh) and the Velocity Actual Value (606Ch) remains within ±606Dh for the duration set in 606Eh, the velocity is considered reached. In Profile Velocity mode, bit 10 of the Status Word (6041h) is set to 1. Otherwise, bit 10 of Status Word (6061h) is set to 0.				

606Fh	-				PV
Index	606Fh	-			
Name	Zero Velocity Threshold				
Object Structure	VAR	Data Type	Uint16	Range	0~65535
Mapping	Y	W/R	RW	Default	10
Function Description	Set the speed threshold to tell if the speed is 0 (unit: 1 rpm). When the Velocity Actual Value (606Ch) remains within ±606Fh for the duration set in 6070h, the user velocity is considered zero and bit 12 of Status Word (6041h) is set to 1. If either condition is not met, the user velocity is considered non-zero and bit 12 is set to 0.				

6070h					PV
Index	6070h	-			
Name	Zero Velocity Threshold Time				
Object Structure	VAR	Data Type	Uint16	Range	0~65535
Mapping	Y	W/R	RW	Default	0
Function Description	Set the speed threshold time to tell if the speed is 0 (unit: 2ms). When the Velocity Actual Value (606Ch) remains within ±606Fh for the duration set in 6070h, the user velocity is considered zero and bit 12 of Status Word (6041h) is set to 1. If either condition is not met, the user velocity is considered non-zero and bit 12 is set to 0.				

6071h	-				PT
Index	6071h	-			
Name	Target Torque				
Object Structure	VAR	Data Type	Int16	Range	-5000~5000
Mapping	Y	W/R	RW	Default	0
Function Description	Set the target reference value for Profile Torque mode and Cyclic Synchronous Torque mode (unit: 0.1%).				

6072h	-		PP	PV	PT	HM	IP
Index	6072h	-					
Name	Max. Torque Limit						
Object Structure	VAR	Data Type	Uint16	Range	-5000~5000		
Mapping	Y	W/R	RW	Default	3000		
Function Description	Set the maximum output torque value of the servo (unit: 0.1%).						

6074h	-		PP	PV	PT	HM	IP
Index	6074h	-					
Name	Torque Demand Value						
Object Structure	VAR	Data Type	Uint16	Range	-5000~5000		
Mapping	Y	W/R	RO	Default	-		
Function Description	Display the current torque command value (unit: 0.1%).						

6075h	-			PP	PV	PT	HM	IP
Index	6075h	-						
Name	Motor Rated Current							
Object Structure	VAR	Data Type	Uint32	Range		Uint32		
Mapping	Y	W/R	RO	Default		0		
Function Description	It indicates the motor rated current on the nameplate (unit: mA). All current-related parameter values are relative to this parameter.							

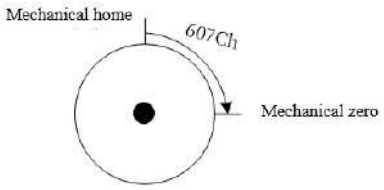
6076h	-			PP	PV	PT	HM	IP
Index	6076h	-						
Name	Motor Rated Torque							
Object Structure	VAR	Data Type	Uint32	Range		Uint32		
Mapping	Y	W/R	RO	Default		0		
Function Description	It indicates the motor rated torque on the nameplate (unit: mNm). All torque-related parameter values are relative to this parameter.							

6077h	-			PP	PV	PT	HM	IP
Index	6077h	-						
Name	Motor Actual Torque							
Object Structure	VAR	Data Type	Int16	Range		Int16		
Mapping	Y	W/R	RO	Default		0		
Function Description	It indicates the instantaneous torque output value of the servo motor (unit: 0.1%).							

6078h	-			PP	PV	PT	HM	IP
Index	6078h	-						
Name	Current Actual Value							
Object Structure	VAR	Data Type	Int16	Range		Int16		
Mapping	Y	W/R	RO	Default		0		
Function Description	It indicates the instantaneous current output of the servo motor (unit: 0.1%).							

607Ah	-		PP
Index	607Ah	-	
Name	Target Position		

Object Structure	VAR	Data Type	Int32	Range	-2^{31}~(2^{31}-1)
Mapping	Y	W/R	RW	Default	0
Function Description	Set the servo target position in user unit under the Profile Position mode. ● When Control Word (6040h-bit6) is 0, 607Ah is the absolute position of the current stage. ● When Control Word (6040h-bit6) is 1, 607Ah is the incremental position of the current stage.				

607Ch	-				HM
Index	607Ch	-			
Name	Home Offset				
Object Structure	VAR	Data Type	Int32	Range	-2^{31}~(2^{31}-1)
Mapping	Y	W/R	RW	Default	0
Function Description	Set the physical position by which the mechanical zero point deviates from the motor home position in user unit under the position mode. Mechanical home=Mechanical Zero+ 607Ch (Home Offset). When set to 0, no offset is applied. 				

607Dh	-			PP	PV	PT	HM	IP
Index	607Dh	-						
Name	Software Position Limit							
Object Structure	VAR	Data Type	Int32	Range		Int32		
Mapping	Y	W/R	RW	Default		0		

Function Description	Set the minimum and maximum software absolute position limits. Minimum absolute position limit = (607D:01h) Maximum absolute position limit = (607D:02h) Software absolute position limit settings: ● When both (607D:01h) and (607D:02h) are set to default values, software limits are disabled. ● If the minimum absolute position limit (607D: 01h) is greater than the maximum absolute position limit (607D: 02h), the values are automatically adjusted internally. ● When the position command or feedback reaches the software limit, in position mode, the servo will move toward the limit position and stop upon reaching it, triggering an over-travel warning. A reverse reference can be issued to move the motor out of the overtravel state. ● Absolute position limits are relative to the Position Actual Value 6064h (user units).

Subindex	00h	-			
Name	Number of Entries				
Object Structure	VAR	Data Type	Uint8	Range	2
Mapping	Y	W/R	RO	Default	2

Subindex	01h	-			
Name	Min. Internal Absolute Position Limit				
Object Structure	VAR	Data Type	Int32	Range	Int32
Mapping	Y	W/R	RW	Default	-2^{31}

Subindex	02h	-			
Name	Max. Internal Absolute Position Limit				
Object Structure	VAR	Data Type	Int32	Range	Int32
Mapping	Y	W/R	RW	Default	$2^{31}-1$

607Eh	-		PP	PV	PT	HM	IP
Index	607Eh	-					
Name	Reference Polarity						
Object Structure	VAR	Data Type	Uint8	Range	Int8		
Mapping	Y	W/R	RW	Default	0		

Function Description	Set the polarity of position, velocity, and torque references.				
	MSB				LSB
	7	6	5	4	0
	Position reference polarity	Velocity reference polarity	Torque reference polarity	NA	
	● Bit7 = 1: Standard position mode. Position command × (-1), motor direction reverses. In profile position mode and cyclic synchronous position mode, both the position reference and target position are inverted. ● Bit6 = 1: Velocity mode. Velocity command (60FFh) × (-1), motor direction reverses. ● Bit5 = 1: Torque mode. Torque command × (-1), motor direction reverses.				

607Fh	-			PP	PV	PT	HM	IP
Index	607Fh	-						
Name	Max Profile Velocity							
Object Structure	VAR	Data Type	Uint32	Range	0~(2^{32}-1)			
Mapping	Y	W/R	RW	Default	838860800			
Function Description	Set the user maximum operating speed (unit: user units/s). This value takes effect when the slave's velocity reference changes. $\text{Max Profile Velocity (rpm)} = \frac{607\text{Fh} \times \frac{6091\text{h}-01}{6091\text{h}-02}}{\text{Encoder Resolution}} \times 60$ Note: In all modes, the maximum operating speed is limited by both 607Fh and function code Pn318, with the lower value applied.							

6080h	-			PP	PV	PT	HM	IP
Index	6080h	-						
Name	Max Motor Speed							
Object Structure	VAR	Data Type	Uint32	Range	0~(2^{32}-1)			
Mapping	Y	W/R	RO	Default	Max. Velocity Limit			
Function Description	It indicates the maximum permissible operating velocity of the motor that can be obtained from the manual of the servomotor (unit: rpm)							

6081h	-				PP
Index	6081h	-			
Name	Profile Velocity				
Object Structure	VAR	Data Type	Uint32	Range	0~(2^{32}-1)
Mapping	Y	W/R	RW	Default	83886080

Function Description	Set the running speed of the constant stage after completing the acceleration in the profile position mode (unit: reference unit/s). $\text{Motor Speed (rpm)} = \frac{6081\text{h} \times \frac{6091:01\text{h}}{6091:02\text{h}}}{\text{Encoder Resolution}} \times 60$

6083h	-			PP	PV
Index	6083h	-			
Name	Profile ACC				
Object Structure	VAR	Data Type	Uint32	Range	0~(2^{32}-1)
Mapping	Y	W/R	RW	Default	83886080
Function Description	Set the acceleration for Profile Position and Profile Velocity modes (unit: reference units/s²). ● In profile position mode: Acceleration changes take effect before the next segment reference is triggered. If modified during the execution of this segment, the new value will apply after the current segment completes. ● In profile velocity mode, the acceleration changes take effect immediately. ● If this is set to 0, the software internally forces it to 1.				

6084h	-			PP	PV
Index	6084h	-			
Name	Profile DEC				
Object Structure	VAR	Data Type	Uint32	Range	0~(2^{32}-1)
Mapping	Y	W/R	RW	Default	83886080
Function Description	Set the deceleration for Profile Position and Profile Velocity modes (unit: command units/s²). ● In profile position mode: Acceleration changes take effect before the next segment reference is triggered. If modified during the execution of this segment, the new value will apply after the current segment completes. ● In profile velocity mode, the acceleration changes take effect immediately. ● If this is set to 0, the software internally forces it to 1.				

6085h	-		PP	PV	PT	HM	IP
Index	6085h	-					
Name	Quick Stop DEC						
Object Structure	VAR	Data Type	Uint32	Range	0~(2^{32}-1)		
Mapping	Y	W/R	RW	Default	2147483647		
Function Description	When Quick Stop (6040h: bit2=0) is active and when 605Ah (Quick Stop Option Code)=2, it defines the deceleration rate for the ramp-down segment.						

6086h				PP	PV
Index	6086h	-			
Name	Motion Profile Type				
Object Structure	VAR	Data Type	Int16	Range	Int16
Mapping	Y	W/R	RW	Default	-
Function Description	It indicates the profile type of the position or velocity reference.				

6087h	-			PT
Index	6087h	-		
Name	Torque Slope			
Object Structure	VAR	Data Type	Uint32	Range	0~65535
Mapping	Y	W/R	RW	Default	1000
Function Description	● Set the torque acceleration in profile torque mode, representing the torque reference increment per second (0.1%/s). ● In Profile Torque mode, when Quick Stop Mode (605Ah)=1 or 2, or when Halt Stop Mode (605Dh)=1 or 2, the system will decelerate to a stop using the value set in 6087h. ● If the parameter is set to 0, it is automatically forced to a value of 1.			

6091h	-		PP	PV	PT	HM	IP
Index	6091h	-					
Name	Gear Ratio						
Object Structure	ARR	Data Type	Uint32	Range	Uint32		
Mapping	Y	W/R	RW	Default	-		
Function Description	Set a proportional relationship between the user-defined load displacement and the motor displacement: Motor displacement (motor unit) = Load displacement (user unit) × position factor The setting of the position factor is related to parameters such as the mechanical reduction ratio, mechanical dimensions, and motor resolution. Calculation method is as follows: $\text{Position Factor} = \frac{\text{Motor Resolution} \times \text{Gear Ratio}}{\text{Load Feed}}$ The gear ratio set in 6091h is in series with the gear ratio settings in Pn204 and Pn206. For CAN-based models, the resulting electronic gear ratio is calculated as: $\text{Gear Ratio} = \frac{Pn204}{Pn206} \times \frac{6091:01h}{6091:02h}$						

Subindex	00h	-			
Name	Number of Entries				
Object Structure	VAR	Data Type	Uint8	Range	2
Mapping	Y	W/R	RO	Default	2

Subindex	01h	-			
Name	Motor Revolutions				
Object Structure	VAR	Data Type	Uint32	Range	Uint32
Mapping	Y	W/R	RW	Default	1

Subindex	02h				
Name	Shaft Revolutions				
Object Structure	VAR	Data Type	Uint32	Range	Uint32
Mapping	Y	W/R	RW	Default	1

6098h	-				HM
Index	6098h	-			
Name	Homing Method				
Object Structure	VAR	Data Type	Int8	Range	0~35
Mapping	Y	W/R	RW	Default	0
Function Description	Select the method for homing:				
	Value	Description			
	1	Starts at the negative limit switch and Z-pulse			
	2	Starts at the positive limit switch and Z-pulse			
	3~4	Starts at the positive home switch and Z-pulse			
	5~6	Starts at the negative home switch and Z-pulse			
	7~14	Starts at the home switch and Z-pulse			
	15~16	NA			
	17~30	Home without reference to Z-pulse			
	31~32	NA			
	33~34	Home without reference to Z-pulse			
	35	Current position as the zero position			

NOTE	
	● ER.E03 will occur when data other than the above is set.

6099h	-				HM
Index	6099h	-			
Name	Home Velocity				
Object Structure	ARR	Data Type	Uint8	Range	Uint32
Mapping	Y	W/R	RW	Default	-
Function Description	There are two speed settings under the home mode. ● 6099-1h: Deceleration Point Search Velocity (unit: reference units/s) ● 6099-02h: Home Point Search Velocity (unit: reference units/s)				

Subindex	00h	-			
Name	Number of Entries				
Object Structure	VAR	Data Type	Uint8	Range	2
Mapping	Y	W/R	RO	Default	2

Subindex	01h	-			
Name	Deceleration Point Search Velocity				
Object Structure	VAR	Data Type	Uint32	Range	$0\sim2^{32}-1$
Mapping	Y	W/R	RW	Default	27962027
Function Description	Set to configure the search speed for the deceleration point signal. We recommend a higher setting to prevent extended homing duration and homing timeout errors.				

Subindex	02_h	-			
Name	Home Point Search Velocity				
Object Structure	VAR	Data Type	Uint32	Range	1~500
Mapping	Y	W/R	RW	Default	5592405

Caution	
	● During homing, the slave will decelerate after detecting the deceleration point signal. ● During deceleration, the slave device ignores changes in the home signal. To avoid finding the home signal during deceleration, please set the deceleration point switch signal appropriately. For example, ensure sufficient deceleration distance or increase the homing acceleration rate.

609Ah	-	HM
Index	609Ah	-
Name	Home ACC/DEC	

Object Structure	ARR	Data Type	Uint32	Range	0~2^{32}-1
Mapping	Y	W/R	RW	Default	83886080
Function Description	Set the acceleration and deceleration under the home mode (unit: reference unit/s^2).				

60C1h	-				IP
Index	60C1h	-			
Name	Interpolation Data Record				
Object Structure	ARR	Data Type	Int32	Range	Int32
Mapping	Y	W/R	RW	Default	0
Function Description	Set the parameters of interpolation mode.				

Subindex	00h	-			
Name	Number of Entries				
Object Structure	VAR	Data Type	Uint8	Range	3
Mapping	N	W/R	RO	Default	3

Subindex	01h	-			
Name	Absolute Position Reference				
Object Structure	VAR	Data Type	Int32	Range	Int32
Mapping	Y	W/R	RW	Default	0
Function Description	It indicates the required absolute value in reference unit.				

60C2h	-				IP
Index	60C2h	-			
Name	Interpolation Period				
Object Structure	ARR	Data Type	Uint8	Range	Uint8
Mapping	Y	W/R	RW	Default	0

Subindex	00h	-			
Name	Number of Entries				
Object Structure	VAR	Data Type	Uint8	Range	2
Mapping	N	W/R	RO	Default	2
Function Description	Set the entry number for the object dictionary in the interpolation cycle.				

Sub-index	01h	-			
Name	Interpolation Period Time				
Object Structure	VAR	Data Type	Uint8	Range	Uint8
Mapping	Y	W/R	RW	Default	1
Function Description	Set the time constant of the interpolation period. The unit is defined by 60C2:02h. Example: If 60C2:02h is -3 and 60C2:01h is 1, the interpolation period is 1ms. Note: The interpolation period must match the synchronous cycle period.				

Subindex	02h	-			
Name	Interpolation Period Time Unit				
Object Structure	VAR	Data Type	Int8	Range	Int8
Mapping	Y	W/R	RW	Default	-3
Function Description	Set the interpolation period unit. A value of -3 indicates the unit is ms. A value of -4 indicates the unit is 0.1ms. A value of -2 indicates the unit is 10ms.				

60C5h	-			PP	PV	PT	HM	IP
Index	60C5h	-						
Name	Max. Profile Acceleration							
Object Structure	VAR	Data Type	Uint32	Range		$0\sim(2^{32}-1)$		
Mapping	Y	W/R	RW	Default		2147483647		
Function Description	Set the maximum profile acceleration (unit: reference unit/s^2).							

60C6h	-			PP	PV	PT	HM	IP
Index	60C6h	-						
Name	Max. Profile Deceleration							
Object Structure	VAR	Data Type	Uint32	Range		0~(2^{32}-1)		
Mapping	Y	W/R	RW	Default		2147483647		
Function Description	Set the maximum profile deceleration (unit: reference unit/s^2).							

60E0h		PP	PV	PT	HM	IP
Index	60E0h	-				
Name	Positive Torque Limit					
Object Structure	VAR	Data Type	Uint16	Range	Uint16	
Mapping	Y	W/R	RW	Default	3000	
Function Description	Set the limit to the positive torque (unit: 0.1%).					

60E1h	-			PP	PV	PT	HM	IP
Index	60E1h	-						
Name	Negative Torque Limit							
Object Structure	VAR	Data Type	Uint16	Range	Uint16			
Mapping	Y	W/R	RW	Default	3000			
Function Description	Set the limit to the negative torque (unit: 0.1%).							

60F4h	-			PP	HM	IP
Index	60F4h	-				
Name	Position Deviation Feedback					
Object Structure	VAR	Data Type	Int32	Range	-2^{31}~(2^{31}-1)	
Mapping	Y	W/R	RO	Default	0	
Function Description	It indicates the real time position deviation in reference unit.					

60FCh	-			PP	HM	IP
Index	60FCh	-				
Name	Motor Position Reference*					
Object Structure	VAR	Data Type	Int32	Range	-2^{31}~(2^{31}-1)	
Mapping	Y	W/R	RO	Default	0	
Function Description	It indicates the motor's real-time position reference (unit before electronic gear: increments). Motor Position Reference*(60FCh)= User Position Reference (6062h) × Gear Ratio (6091h)					

60FDh	-			PP	PV	PT	HM	IP
Index	60FDh	-						
Name	Digital Input							
Object Structure	VAR	Data Type	Uint32	Range		0~(2^{32}-1)		
Mapping	Y	W/R	RO	Default		0		
Function Description	It indicates the current digital input terminal logic of the drive, 0 indicating invalid and 1 indicating valid. The DI signals on each bit are as follows:							
	MSB							LSB
	31~16	15~4	3	2	1	0		
	Manufacturer-defined	NA	Undefined	Home signal	Positive overtravel switch	Negative overtravel switch		

60FEh	-		PP	PV	PT	HM	IP
Index	60FEh	-					
Name	Digital Output						
Object Structure	ARR	Data Type	Uint32	Range		Uint32	
Mapping	Y	W/R	RO	Default		0	

Subindex	00h	-			
Name	Number of Entries				
Object Structure	VAR	Data Type	Uint8	Range	1
Mapping	N	W/R	RO	Default	1

Subindex	01h	-			
Name	Physical Output				
Object Structure	VAR	Data Type	Uint32	Range	Uint32
Mapping	Y	W/R	RO	Default	0
Function Description	It indicates the current digital output terminal logic of the drive, 0 indicating invalid and 1 indicating valid. The DO signals on each bit are as follows:				
	MSB				LSB
	31~16	15~1			0
	Manufacturer-defined	NA			Brake output

60FFh	-			PV	CSV
Index	60FFh	-			
Name	Target Velocity				
Object Structure	VAR	Data Type	Int32	Range	Int32
Mapping	Y	W/R	RW	Default	0

Function Description	Set the speed reference (unit: user unit/s) in Profile Velocity mode (PV).

6502h	-				
Index	6502h	-			
Name	Supported Drive Modes				
Object Structure	VAR	Data Type	Uint16	Range	Uint16
Mapping	Y	W/R	RO	Default	6D
Function Description	Drive modes supported by the driver. 0: Not Supported, 1: Supported.				

Bit	Description	Value
0	Profile position mode	1
1	NA	0
2	Profile velocity mode	1
3	Profile torque mode	1
4	NA	0
5	Home mode	1
6	Interpolation position mode	1
7~15	NA	0

5.2 CANopen Abort Codes

Code	Description
0x05040001	Invalid control command (SDO only supports 0x40, 0x2F, 0x2B, 0x23)
0x06010002	Attempt to write a read-only object
0x06020000	Object does not exist in the object dictionary
0x06040041	Object cannot be mapped to PDO
0x06040042	Number and length of mapped objects exceed PDO length
0x06070010	Data length mismatch (object dictionary length differs from write data length)
0x06070012	Data type mismatch, service parameter length mismatch
0x06090011	Sub-index does not exist
0x06090031	Parameter value written is too large
0x06090032	Parameter value written is too small

6 Appendix

6.1 Appendix 1 Terminal X Functions

Setting: 0x01			
Mark	Enable servo drive	Trigger	Control Mode
S-ON	This signal is used to activate the servo drive. ● Invalid: Servo motor is not enabled (Servo-OFF). ● Valid: Servo motor is enabled (Servo On).	High/low level	Ⓟ Ⓢ Ⓣ

Setting: 0x02			
Mark	Forward drive inhibit	Trigger	Control Mode
P-OT	This signal is used to limit the motor from forward operation when a forward reference is sent externally. ● Invalid: Motor continues to run forward. ● Valid: Motor stays.	High/low level	Ⓟ Ⓢ Ⓣ

Setting: 0x03			
Mark	Reverse drive inhibit	Trigger	Control Mode
N-OT	This signal is used to limit the motor from reverse operation when a reverse command is sent externally. ● Invalid: motor continues to run reversely. ● Valid: Motor stays.	High/low level	Ⓟ Ⓢ Ⓣ

Setting: 0x04			
Mark	Error reset	Trigger	Control Mode
ALM-RST	This signal is used to clear an error prompt that has occurred in the drive. Invalid: Error reset inhibit Valid: Error reset available	High/low level	Ⓟ Ⓢ Ⓣ

Setting: 0x05			
Mark	PI/P shift	Trigger	Control Mode
P-CON	This signal is used to switch the PI (Proportional/Integral) and P (Proportional) regulators of the drive's speed loop. ● Invalid: PI control (proportional/integral). ● Valid: P control (proportional).	High/low level	Ⓟ Ⓢ Ⓣ

Setting: 0x06			
Mark	Torque limit shift	Trigger	Control Mode
TL-SEL	This signal is used to limit the forward and reverse torque of the drive. Position mode or speed mode: ● Invalid: Limit forward and reverse torque by Pn053. ● Valid: Limit forward and reverse torque by Pn054. Torque mode: ● Invalid: Limit forward and reverse torque by Pn051. ● Valid: Limit forward and reverse torque by Pn052.	High/low level	Ⓟ Ⓢ Ⓣ

Setting: 0x08			
Mark	Speed reference direction	Trigger	Control Mode
SPD-D	This signal is used to adjust the direction of the speed reference in speed mode. ● Invalid: The same as the speed reference ● Valid: Opposite to the speed reference	High/low level	Ⓢ

<table>
<tr><td colspan="4">Setting: 0x09, 0x0A</td></tr>
<tr><td>Mark</td><td colspan="2">Internal register speed reference buffer</td><td>Trigger</td><td>Control Mode</td></tr>
<tr><td>SPD-A
SPD-B</td><td colspan="2">● SPD-A: Internal register speed reference buffer 1
● SPD-B: Internal register speed reference buffer 2
<table><tr><th>SPDB</th><th>SPDA</th><th>Reference source</th></tr><tr><td>0</td><td>0</td><td>Pn304 setting</td></tr><tr><td>0</td><td>1</td><td>Pn305 setting</td></tr><tr><td>1</td><td>0</td><td>Pn306 setting</td></tr><tr><td>1</td><td>1</td><td>Pn307 setting</td></tr></table></td><td>High/low level</td><td>S</td></tr>
<tr><td colspan="4">Setting: 0x0B</td></tr>
<tr><td>Mark</td><td colspan="2">Control mode shift</td><td>Trigger</td><td>Control Mode</td></tr>
<tr><td>C-SEL</td><td colspan="2">This signal is used to shift the control mode.
<table><tr><th>P000.X Setpoint</th><th colspan="2">Control Mode Shift Signal (/C-SEL)</th></tr><tr><td></td><td>High level (H)</td><td>Low level (L)</td></tr><tr><td>3</td><td>Velocity mode</td><td>Position mode</td></tr><tr><td>4</td><td>Torque mode</td><td>Position mode</td></tr><tr><td>5</td><td>Velocity mode</td><td>Torque mode</td></tr></table></td><td>High/low level</td><td>P S T</td></tr>
</table>

Setting: 0x0C			
Mark	Zero clamp	Trigger	Control Mode
ZCALMP	This signal is used to send zero clamp signal to the drive. ● Invalid: Zero clamp function is off ● Valid: Zero clamp function is on	High/low level	S

Setting: 0x0D			
Mark	Reference pulse inhibit	Trigger	Control Mode
INHIBIT	This signal is used to control reference pulses sending to the drive. ● Invalid: Drive stops receiving reference pulses and counting ● Valid: Drive receives reference pulses and counts	High/low level	P

Setting: 0x0E			
Mark	Gain shift	Trigger	Control Mode
G-SEL	This signal is used to select between the two gains in speed and position mode. ● Invalid: Switch to 1st gain. ● Valid: Switch to 2nd gain.	High/low level	P S T

Setting: 0x0F			
Mark	Torque reference direction shift	Trigger	Control Mode
TPR-D	This signal is used to adjust the output direction of the torque reference via this terminal in the torque mode: ● Invalid: Same as the torque reference ● Valid: Opposite to the torque reference	High/low level	T

Setting: 0x10			
Mark	Pulse reference multiplier shift	Trigger	Control Mode
P-GAIN	This signal is used to set the frequency multiplier of the reference pulse input under position mode. ● Invalid: Same as input ● Valid: Use multiplier	High/low level	P

Setting: 0x11			
Mark	Pulse deviation clear	Trigger	Control Mode
CCLR	● This signal is used to clear the pulse count buffer, which is decided by Pn200.Y. ● When this signal is valid, the position pulse deviation accumulated by the servo drive is cleared to zero.	Edge High/low level	P

<table>
<tr><th colspan="4">Setting: 0x12, 0x13</th></tr>
<tr><td>Mark</td><td>Internal register torque reference buffer</td><td>Trigger</td><td>Control Mode</td></tr>
<tr><td>TOR-A
TOR-B</td><td>● TOR-A: Internal register torque reference buffer 1
● TOR-B: Internal register torque reference buffer 2
<table>
<tr><th>TOR-B</th><th>TOR-A</th><th>Reference source</th></tr>
<tr><td>0</td><td>0</td><td>Pn410 setting</td></tr>
<tr><td>0</td><td>1</td><td>Pn411 setting</td></tr>
<tr><td>1</td><td>0</td><td>Pn412 setting</td></tr>
<tr><td>1</td><td>1</td><td>Pn413 setting</td></tr>
</table></td><td>High/low level</td><td>T</td></tr>
</table>

Setting: 0x15			
Mark	Torque mode speed limit source	Trigger	Control Mode
T-SLMT	This signal is used to select the desired speed limit source in torque control. ● Invalid: Limit by Pn415. ● Valid: Limit by Pn416.	High/low level Edge	T

Setting: 0x17			
Mark	Positive jog	Trigger	Control Mode
JOGP	This terminal is used to input a negative jog speed reference to the drive. ● Invalid: Jog speed reference input OFF. ● Valid: Positive jog speed reference input ON.	High/low level	P S T

Setting: 0x18			
Mark	Reverse Jog	Trigger	Control Mode
JOGN	This terminal is used to input a negative jog speed reference to the drive. ● Invalid: Jog speed reference input OFF. ● Valid: Negative jog speed reference input ON.	High/low level	P S T

Setting: 0x19			
Mark	Emergency stop	Trigger	Control Mode
EMSTOP	This terminal is used to input an emergency stop command to the drive. ● Invalid: servo drive maintains the current operating status. ● Valid: Coasting stop and motor shaft locked.	High/low level	Ⓟ Ⓢ Ⓣ

Setting: 0x1A			
Mark	Control mode shift 2	Trigger	Control Mode
C-SEL2	● This signal is used to shift control mode when Pn000.X=6.	High/low level	Ⓟ Ⓢ Ⓣ

Setting: 0x1B						
Mark	Control mode confirm				Trigger	Control Mode
C-Trig	This terminal is used to confirm the selected control mode when Pn000.X=6.				Edge	Ⓟ Ⓢ Ⓣ
	Pn000.X Setpoint	Control mode shift signal		C-Trig	Control Mode	
		C-SEL	CSEL2			
	6	0	0	↑	Velocity mode	
		0	1		Position mode	
		1	0		Torque mode	

Setting: 0x1F			
Mark	Brake input	Trigger	Control Mode
BKSel	● This signal is used to control the brake via external terminals. When the brake is controlled externally, it disables the brake enable logic.	High/low level	P S T

Setting: 0x20			
Mark	Internal position reference	Trigger	Control Mode
CTRG	● In the PR mode, the position references selected from POS0 to POS5 are read into the controller at the moment of CTRG conduction (rising edge).	High/low level	P

Setting: 0x20			
Mark	Internal position reference	Trigger	Control Mode
CTRG	● In the PR mode, the position references selected from POS0 to POS5 are read into the controller at the moment of CTRG conduction (rising edge).	High/low level	P

Setting: 0x27			
Mark	Home enable	Trigger	Control Mode
ORGEN	● In position mode, when the terminal triggers home return, the home command is read into the controller.	High/low level Edge	P

Setting: 0x28			
Mark	Mechanical home signal	Trigger	Control Mode
ORGS	This signal is used as a home signal source during home mode. ● Invalid: Home signal not met ● Valid: Home signal met	Rising edge	Ⓟ

6.2 Appendix 2 Terminal Y Functions

Setting: 0x01			
Mark	Servo ready (/S-RDY)	Trigger	Control Mode
RDY	● If the servo drive is ready and there is no fault at present, the output of this signal is ON. ● If the servo is ready or currently faulty, this signal output is OFF.	High/low level	Ⓟ Ⓢ Ⓣ

Setting: 0x02			
Mark	Position Coincidence	Trigger	Control Mode
COIN	● When the current position deviation is within Pn262 [/COIN Signal Width], this signal output is ON. ● When the current position deviation is not within Pn262 [/COIN Signal Width], this signal output is OFF.	High/low level	Ⓟ

Setting: 0x03			
Mark	Velocity Clamp	Trigger	Control Mode
V-CMP	● When the deviation between the motor feedback speed and the target is within Pn320 [/V-CMP Signal Width], this signal output is ON. ● When the deviation between the motor feedback speed and the target is not within Pn320 [/V-CMP Signal Width], this signal output is OFF.	High/low level	Ⓟ Ⓢ Ⓣ

Setting: 0x04			
Mark	Motor rotation signal	Trigger	Control Mode
TGON	● When the motor running speed is lower than the motor rotation detection threshold (Pn317), this signal is OFF. ● When the motor running speed is lower than the motor rotation detection threshold (Pn317), this signal is ON.	High/low level	Ⓟ Ⓢ Ⓣ

Setting: 0x04			
Mark	Motor rotation signal	Trigger	Control Mode
TGON	● When the motor running speed is lower than the motor rotation detection threshold (Pn317), this signal is OFF. ● When the motor running speed is lower than the motor rotation detection threshold (Pn317), this signal is ON.	High/low level	Ⓟ Ⓢ Ⓣ

Setting: 0x05			
Mark	Torque limit in effect	Trigger	Control Mode
TLT	● When the output torque of the motor is within the set range, this signal is ON. ● When the output torque of the motor is not within the set range, this signal is OFF.	High/low level	Ⓟ Ⓢ Ⓣ

Setting: 0x06			
Mark	Velocity limit	Trigger	Control Mode
VLT	In torque mode: ● When the motor speed is not within the set speed limit, this signal is ON. ● When the motor speed is within the set speed limit, this signal is OFF.	High/low level	T

Setting: 0x07			
Mark	Brake output signal	Trigger	Control Mode
BK	● When this signal is invalid, the brake power supply disconnects, the brake engages, and the motor position is locked. ● When this signal is valid, the brake power supply connects, the brake opens, and the motor will be able to rotate.	High/low level	P S T

Setting: 0x08			
Mark	Alarm output signal	Trigger	Control Mode
/WARN	● When alarm occurs on the current drive, this signal is ON. ● When no alarm occurs on the current drive, this signal is OFF.	High/low level	P S T

Setting: 0x09			
Mark	Position near signal	Trigger	Control Mode
NEAR	● When the current position deviation is within Pn260 [/Near Signal Width], this signal is ON. ● When the current position deviation is not within Pn260 [/Near Signal Width], this signal is OFF.	High/low level	P S T

Setting: 0x0A			
Mark	Reference pulse input multiplier	Trigger	Control Mode
PSELA	● When the pulse input multiplier is used, this signal is ON. ● When the pulse input multiplier is not used, this signal is OFF.	High/low level	Ⓟ Ⓢ Ⓣ

Setting: 0x0B			
Mark	Error output signal	Trigger	Control Mode
Alarm	● When an error occurs on the drive, this signal is ON. ● When no error occurs on the drive, this signal is OFF.	High/low level	Ⓟ Ⓢ Ⓣ

Setting: 0x0C			
Mark	Target torque reach	Trigger	Control Mode
TorqR	● Set the corresponding timing using function codes Pn420 and Pn421.	High/low level	Ⓟ Ⓢ Ⓣ

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