RS OEMax

RSWare User Manual

User Manual

Version 1.2.1

RS Reliable & Smart Automation

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, RS Automation does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

WARNING 	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.
ATTEN- 	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.
WARNING 	Labels may be located on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
BURN HAZ- 	Labels may be located on or inside the equipment, for example, a drive or motor, to alert people that surfaces may be at dangerous temperatures.

Table of Contents

Preface

Introduction

Read this preface to familiarize you with the rest of the manual. This preface covers the following topics:

- Introduction
- Who Should Use this Manual
- Conventions Used in this Manual
- Related Documentation
- Using Online Help
- RS Automation Support

Who Should Use This Manual

Use this manual when RSWare Version1.2.1 is used to configure and operate CSD5 (Firmware Ver1.21) and KNX3 (Firmware Ver1.10) drives.

Where to Find Help

You can find help for RSWare in both this User Manual, and Online Help.

Conventions Used in This Manual

The following conventions are used throughout this manual.

- Bulleted lists provide information, not procedural steps
- Numbered lists provide sequential steps.
- Words you type or select, and keys that you press, appear in **bold**

Related Documentation

These publications provide additional information. To obtain a copy, contact your local RS Automation office or distributor, or access the documents on-line at www.rsautomation.co.kr or http://www.rsautomation.biz/.

For information about:	Read this document	Publication Number
Information on the installation of your CSD5 servo drive	CSD5 Servo Drive Installation Instructions	CSD5-IN001
Information on the motors used together with CSD5 servo drive	Servo Motor User Manual	SMOTOR-UM002
CSD5 User Manual	CSD5 User Manual	CSD5-UM001A

Using Online Help

The following types of online help are available:

To use this:	Do this:	Description
RSWare Help	Select Contents and Index from the Help menu. Navigate the help files using the Table of Contents, the Index and the Search tabs	Descriptions of all on-screen object. Object property configuration settings. How to information.
Context Sensitive Help	Either: •Click on a Help button in the active window, or •Select an on-screen object press **F1**	For help about the selected object.

RS Automation Support

Local Product Support

Contact your local RS Automation representative for:

- Sales and order support
- Product technical training
- Warranty support
- Support service agreements

Technical Product Assistance

If you need to contact RS Automation for technical assistance, please review the information in this manual or in the Online Help file first. Then call your local RS Automation representative. For the quickest possible response, we recommend that you have the catalog numbers of your products available when you call.

Before You Begin

Introduction

RSWare is a Windows 2000, XP, Vista, Windows 7 application by RS Automation that provides a complete setup for the CSD5 and KNX3 drives. Use RSWare to:

- Communicate with multiple CSD5 and KNX3 drives, using your PC's serial port.
- Adjust the drives' feedback loop gains and parameters for the specific motors and loads.
- Define the drives' motion capabilities by selecting the operating modes for the CSD5 or KNX3.
- Monitor a wide variety of status and motion parameters on the drives.
- Customize the application interface to display only the information you wish to see.

Chapter Overview

Before you begin using RSWare, read this chapter to become familiar with:

- Understanding the RSWare Interface
- Starting RSWare

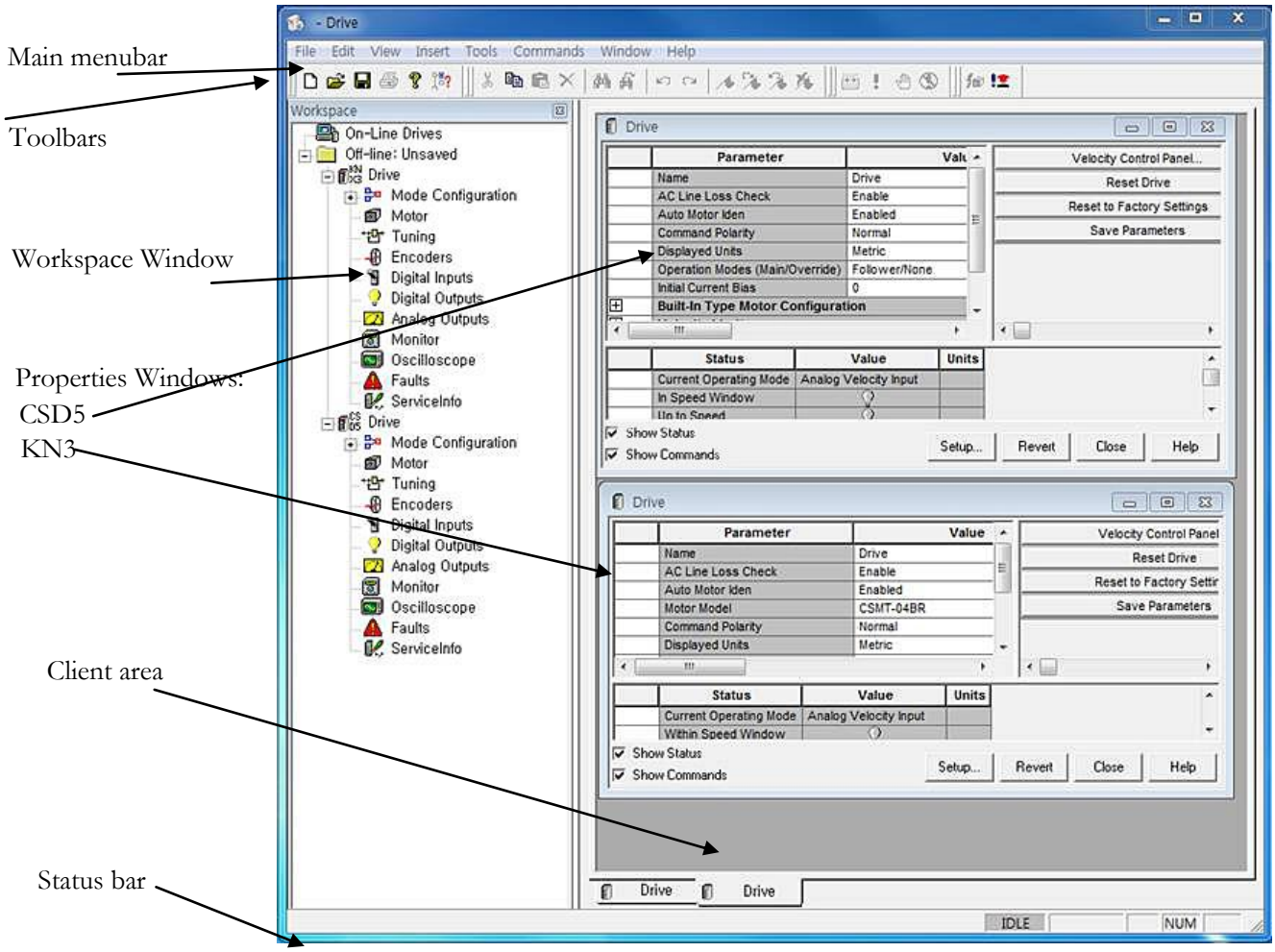
Understanding the RSWare Interface

RSWare provides a graphical user interface within which you configure your drives. The workspace consists of:

- a Workspace window
- a Client Area
- an Output window
- a Main menubar
- a set of Toolbars
- a Status bar

Use the View menu commands to enable and disable these RSWare

The RSWare user interface for CSD5 and KNX3 drives, with several features enabled, looks like this:



Workspace window

The Workspace window is located, by default, beneath the menubar and toolbars, and above the Status Bar. Use the F7 key to return focus to the Workspace window.

The Workspace window has two main branches:

Branch	Description of Display
On-Line Drives branch	All connected on-line drives and their child objects.
RSWare File branch	All configured off-line CSD5 and KNX3 drives, their child objects.

Use the Workspace window to navigate to all of the connected on-line and off-line objects and perform the following tasks:

- Create new Drive.
- Cut, Copy, Paste and Delete selected Workspace window objects.
- Open the Properties dialog box for selected Workspace window objects.

You can resize and move the Workspace window in several ways:

- With the Workspace window in its default state (i.e., attached to the RSWare interface) you can double-click on the Workspace window's title bar to detach it from the RSWare interface.
- Once detached, the Workspace window possesses all the properties of any window. It can be resized or moved entirely outside the RSWare interface.
- To return the Workspace window to its default position, just double click on its title bar.

To hide the Workspace window, de-select the Workspace selection in the View menu.

Client Area

The Client Area is the large gray area located, by default, beneath the menubar and toolbars and to the right of the Workspace window.

Use the Client Area to display:

- Property windows for objects selected in the Workspace window, where you can configure the selected object's properties.

Selecting Workbook Mode from the View menu displays a tab for each object in the Client Area. The tab contains the abbreviated name of the related object. Select a tab to bring the related object to the top of the Client Area.

Unlike windows, the Client Area cannot be directly resized. The size of the Client Area depends upon the size and location of the surrounding Workspace and Output windows, the Main menubar, the Status Bar and the several toolbars.

However, you can use the Cascade, Tile Wide, Tile Tall and Arrange Icons Window menu commands to arrange the display of windows in the client area.

Main Menubar

The Main menubar is located at the top of the RSWare interface. Use it to customize the RSWare main window, and to perform essential functions and procedures with respect to objects selected in the Main Window.

The main menubar looks like this:

The menu items contain the following commands:

Menu Name	Contains these Commands
File	New, Open, Save, Save As, Close, Print, Print Preview, Print Setup, Import, Export, Upgrade Firmware, Recent File, Exit
Edit	Undo, Redo, Cut, Copy, Paste, Delete, Find, Replace, Select All, Go To... Corresponding { } ( ), Go To ...Line Number, Toggle Bookmark, Next Bookmark, Previous Bookmark, Clear All Bookmarks, Properties
View	Toolbars, Status Bar, Workspace, Output, Workbook Mode
Insert	CSD5, KNX3
Tools	Customize, Rescan, Rescan Options, Serial Port,
Commands	Enabled
Window	Close All, Cascade, Tile Wide, Tile Tall, Arrange Icons
Help	Contents and Index, Tip Of The Day, Release Notes, About RSWare

Toolbars

RSWare offers four standard Windows toolbars, which can be detached from the RSWare user interface and relocated. To return a toolbar to its last docking position, just double-click on its header bar.

The RSWare toolbars are:

Toolbar Name	Contains these Commands
File	New, Open, Save, About, Locate
Edit	Cut, Copy, Paste, Erase
Enable	Enable, Disable All

Use the **Toolbars** command (in the View menu) to open the Toolbars dialog box, and enable or disable existing toolbars, and create new toolbars.

Use the **Customize** command (in either the Toolbars dialog box or the Tools menu) to open the Customize dialog box, where you can:

- add a command icon to a toolbar by dragging it from the Command tab and dropping it on the desired toolbar, and
- delete a command icon from a toolbar by dragging it from a toolbar and dropping it off the toolbar.

Status Bar

To display the Status bar, use the View menu Status Bar command. The status bar contains:

- Tooltip help: a description of the menu or button command immediately beneath the pointer.
- Indicators for caps lock (CAP), num lock (NUM) and scroll lock (SCRL).
- The Row and Column reference for the cursor, if a source file or header file has focus in the Text Editor.

When the status bar is visible, a check mark appears to the left of the Status Bar command in the View menu.

Starting RSWare

When you start RSWare for the first time, RSWare prompts you to **Open Last File, xxx.udb**, **Open existing file**, or **Create new file**. After you select the file to open or create, RSWare scans the network for online drives.

You may need to configure your PC's serial port settings (Refer to Serial Port Settings on page 13) and rescan the network (Refer to Scanning the Network on page 12) to insure that RSWare successfully locates all online network drives.

Opening an RSWare File

RSWare stores the name and location of any open RSWare file in its memory, when you last closed RSWare. Each time RSWare opens, it displays a dialog box that lets you do one of the following:

Dialog Select(s)	Description
Open Last File, xxx.udb and then **OK**	Opens the most recently used RSWare file.
Open existing file and then **OK**	Open another, existing RSWare file of your choice.
Create new file and then **OK**	Open a new RSWare file.
Cancel	Open RSWare without an active file in the Workspace window.

Note: A new file is stored in temporary storage until saved.

Scanning the Network

Every time RSWare opens, it conducts a search of the network for all connected drives. A Scan For On-Line Drives dialog box appears. This dialog box displays RSWare's progress in checking for on-line drives on nodes 0 to 10, and the specific task RSWare is currently undertaking (e.g., Scanning Node… or Attaching to Node…).

To stop the process of scanning for - and attaching to - on-line drives, click on the Stop Scanning button.

RSWare displays every drive it detects in the On-Line Drives branch of the Workspace window. Because RSWare does not automatically update the Workspace window, select Rescan from the Tools menu to display the list of drives that are currently on-line.

Serial Port Settings

After you open RSWare for the first time, you may wish to change the configuration of your PC's serial port and baud rate settings from the defaults of COM1, 57600 Baudrate, 8 Data bits and No Parity. To do this:

1. Select **Serial Port…** from the Tools menu.
2. In the PC Communications Setup dialog box, type the appropriate serial port settings.

Upgrading Firmware

You can use the RSWare interface to upgrade the firmware for a selected on-line drive. Use the Upgrade Firmware…command (in the File menu) to open the Firmware Upgrade dialog box, where you can perform a flash upgrade to the firmware of a drive appearing in the On-Line Drives branch of the Workspace window. Before issuing the Upgrade Firmware…command, be sure to first obtain a copy of the new firmware and any related instructions.

To upgrade firmware in the Firmware Upgrade dialog box:

1. Select the drive for firmware upgrade from the list of On-Line Drives. If a drive name has been left blank, it is identified as < Drive>.
2. Enter the pathname of the new firmware file. Either type in the pathname, or use the browse button (marked with an ellipsis "…") to navigate to the new firmware file. (The new firmware file must have an extension of .hex.)
3. Select the Begin Load button. RSWare informs you of firmware upgrade progress using both a progress bar and status messages.

IMPORTANT	You can cancel the firmware upgrade during the upgrade process by selecting the **Cancel** button. However, If you cancel the firmware upgrade while it is in progress, the selected drive ceases to be functional. Thereafter, the selected drive can be used only to complete a subsequent firmware upgrade.

Common Commands for RSWare Drive Configuration

Chapter Overview

Use RSWare to configure both an on-line and an off-line drive. You can configure an on-line drive, then copy or move it to an off-line RSWare file, or configure an off-line drive (in an RSWare file), then copy and paste it onto an existing on-line drive, thereby overwriting the on-line drive's settings. You can also use RSWare's drag-and-drop functionality to accomplish the copy and paste process in a single step.

This chapter covers:

- Opening RSWare
- Creating, Opening and Saving RSWare Files
- Creating a New Drive
- Importing and Exporting a Drive
- Working in the Workspace Window

Opening RSWare

Before you create a new off-line drive, you must first create an RSWare file to contain the new drive. When RSWare opens for the first time, a dialog box like the following one appears:

If you:

- Select **Open Last File:<filename>** and click **OK**, RSWare opens the most recently used RSWare file.
- Select **Open existing file…** and click **OK**, the Open dialog box appears, where you can navigate to and open a previously saved RSWare file.

- Select **Create new file** and click **OK**, a new, empty file is created.

  Note: A new file is stored in temporary storage, and the Workspace icon displays Unsaved until the file is saved with a filename.

- Click the **Cancel** button, RSWare does not open an RSWare file.

RSWare displays the selected RSWare file, if any, in an Off-Line branch of the Workspace window.

Creating, Opening and Saving RSWare Files

An RSWare File is a container that can hold any number or combination of off-line CSD5 and KNX3 drives, projects and their children. An RSWare File is distinguished by its extension of .udb

Creating a New RSWare File

To create a new RSWare DataBase (.udb) file:

1. Do one of the following:

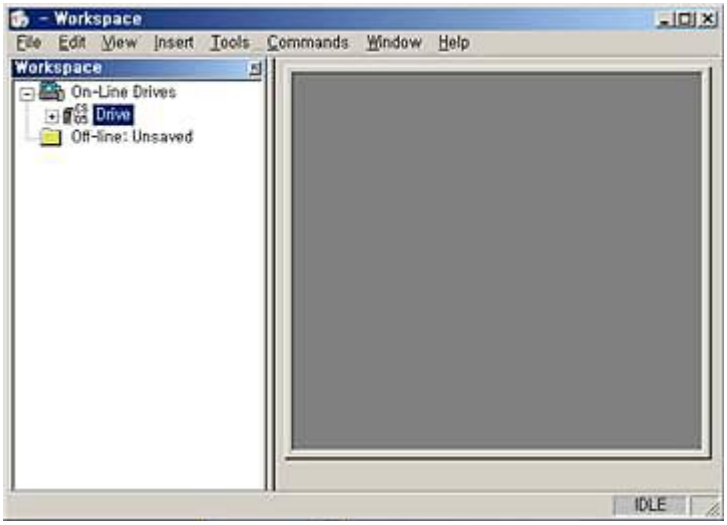
   - Select **New** in the File menu
   - Click on the **New** icon in the File toolbar
   - Press the **Ctrl + N** keys

Note: If an RSWare file is already open, a Save Changes dialog opens and requires a response before the request to open a new file executes. Choosing one of the following from the dialog opens the new RSWare file:

Dialog Selects	Description
Yes	Saves the open file under the filename and location previously designated.
No	Discards the changes to the open file.
Cancel	Aborts the new RSWare file, leaving the previous file open.

2. A new RSWare File, titled Unsaved, appears in the Workspace under On-Line Drives.
3. The RSWare file can be populated with drives as described in "Creating a New Drive" on page 17, and saved under a name using the directions in "Saving an RSWare File" on page 17.

Opening an Existing RSWare File



To open an existing RSWare File:

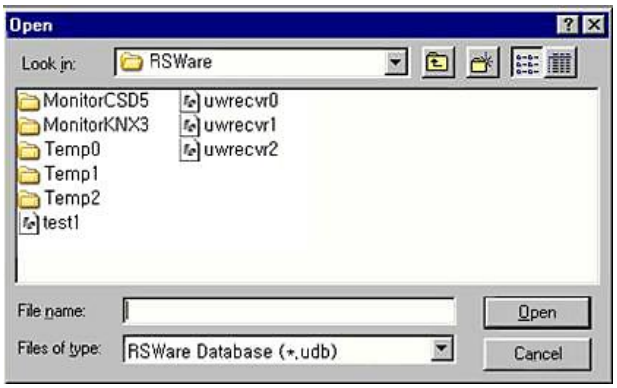
1. Do one of the following:

   - Select **Open** in the menu.
   - Click on the **Open** icon in the File toolbar
   - Press the **Ctrl +O** Keys

Note: If an RSWare file is already open, a Save Changes dialog opens and requires a response before the request to open a new file executes. Choosing one of the following from the dialog opens the new RSWare file:

Dialog Selects	Description
Yes	Saves the open file under the filename and location previously designated.
No	Discards the changes to the open file.
Cancel	Aborts the new RSWare file, leaving the previous file open.

The Open dialog box opens:



2. Navigate to and select the name of the RSWare File to open.
3. Click Open. The selected RSWare File appears in the Workspace window. If the Workspace window had displayed a previously opened RSWare File, the selected RSWare File is displayed in its place.

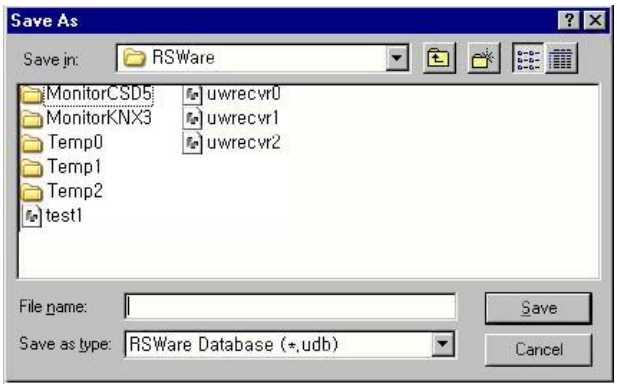
Saving an RSWare File

To save all changes made to a drive or a project:

1. Do one of the following:
   - Select **Save** in the File menu.
   - Click on the **Save** icon in the File toolbar
   - Press the **Ctrl +S** keys

To save an RSWare File to a new filename:

1. Select **Save As** in the File menu. The Save As dialog box opens:



2. Type or select a file name.
3. Navigate to the location where the new RSWare File should be stored.
4. Click Save.

Note: Save As saves the entire RSWare database (.udb) file to a new name.

Creating a New Drive

With an RSWare File open in the Workspace window, you can add a new off-line CSD5 or KNX3 drive.

To add a new CSD5 drive, do one of the following:

- Select CSD5 from the Insert Menu.
- With the RSWare File selected, click the right mouse button, then select Insert CSD5 from the pop-up menu.

A new CSD5 drive appears as the bottom drive in the Workspace window. The name of the new drive is Drive or (if Drive already exists) Drive n, where n is

the lowest positive integer that creates a unique drive name for the specific drive model.(i.e., Two CSD5 drives may be named Drive and Drive1, and two KNX3 drives may also be named Drive and Drive 1.)

To add a new KNX3 drive, do one of the following:

- Select KNX3 from the Insert Menu.
- With the RSWare File selected, click the right mouse button, then select Insert KNX3 from the pop-up menu.

A new KNX3 drive appears as the bottom drive in the Workspace window. The name of the new drive is Drive or (if Drive already exists) Drive n, where n is the lowest positive integer that creates a unique drive name.

Importing and Exporting a Drive

You can import an existing, previously configured drive to an RSWare File using the File menu's **Import** command.

Only drives that have been previously exported, using the File menu's Export command, can be imported. Exporting a drive saves it as an User data eXchange File with an .uxf extension.

Exporting a Drive

To Export a drive:

1. Select a drive branch.
2. Do one of the following:
   - Select **Export** from the File menu, or
   - Place the cursor over the select drive branch, click the right mounse button and select **Export** from the pop-up menu.

The Export to dialog box opens:

3. In the Export To dialog box, type or select a name for the drive.

4. Navigate to a location to which the file should be exported.
5. Click Save. The exported file is saved as an User data eXchange File (with an .uxf extension).

Importing a Drive

1. To Import a previously exported drive:
2. Either:

   - Select **Import** from the File menu or
   - Place the cursor over the selected RSWare File, click the right mouse button and select **Import** from the pop-up menu.

     The Import From dialog box open:

3. In the Import From: dialog box, navigate to and select the User data eXchange File (.uxf) that contains the desired drive settings.
4. Click Open. RSWare displays the imported drive in the off-line RSWare file.

Working in the Workspace Window

You can use the Edit menu commands to Cut, Copy, Paste and Delete/ Erase items in the Workspace window. You can also use RSWare's Drag and Drop function in place of Cut and Paste.

Cut

The Cut command removes certain selected items from the Workspace window. Any item cut from the Workspace window replaces any other item previously cut (or copied) and stored in RSWare's clipboard.

The following Workspace window items cannot be cut:

- The On-Line Drives branch

- A drive in the On-Line Drives branch
- An RSWare file
- Any child branch of a drive

To cut an item from the Workspace window:

1. Select a Workspace window item (other than one of those listed above).
2. Do one of the following:
   - Select **Cut** from the Edit menu
   - Click the right mouse button, then select **Cut** from the pop=up menu
   - Simultaneously press the **Ctrl +X** keys
   - Click on the Cut icon in the Edit toolbar.
3. RSWare displays a message box asking you if you wish to continue. Select OK to cut or Cancel.

Copy

The Copy command copies certain selected items from the Workspace window. Any branch or item copied in the Workspace window replaces any other branch or item previously copied (or cut) and stored in RSWare's clipboard.

The following Workspace window items cannot be copied:

- An RSWare file
- Child branches of a drive.

To Copy an item from the Workspace window:

1. Select a Workspace window item (other than one of those listed above).
2. Do one of the following:
   - Select **Copy** from the Edit menu
   - Click the right mouse button, then select **Copy** from the pop=up menu
   - Simultaneously press the **Ctrl +C** keys
   - Click on the Copy icon in the Edit toolbar.

Paste

The Paste command inserts a previously copied or cut Workspace window item or branch into the selected location of the Workspace window.

When pasting into the Workspace window, three results can occur:

- If the selected Workspace window item is of the same type as the item to be pasted, the pasted item REPLACES the selected item.
- If the selected Workspace window item is a parent branch that must always have one child of the same type as the item to be pasted, the pasted item REPLACES the selected branch's child of the same type.
- If the selected Workspace window branch can have multiple child branches of the same type as the item to be pasted, the pasted item:

  - REPLACES a child branch with the same name as the pasted item, or

  - is ADDED as an additional child branch, if no other child branch shares the pasted item's name.

Any Workspace window item can be selected to receive a pasted item except the following:

- Child branches of a CSD5 drive.
- Child branches of a KNX3 drive.

To Paste an item in the Workspace window:

1. Select a Workspace window branch (other than On-Line Drives, a child project in Archives, or a drive's children.)
2. Do one of the following:
   - Select Paste from the Edit menu
   - Click the right mouse button, then select Paste from the pop-up menu
   - Simultaneously press the **Ctrl** + **V** keys
   - Click on the Paste icon in the Edit toolbar.

     If you are pasting an item into the Workspace window that replaces another item of the same name, RSWare displays a message box asking you if you wish to continue.
3. Select **OK** to paste or **Cancel**.

Delete

The Delete command removes selected branches or items from the Workspace window. The deleted item is permanently destroyed. The Delete command cannot be reversed by an Undo command.

The following Workspace window items cannot be deleted:

- The On-Line Drives branch
- A drive in the On-Line Drives branch
- An RSWare file

- An immediate child item branching directly from a drive

To Delete an item in the Workspace window:

1. Select a Workspace window branch (other than one those listed above).
2. Do one of the following:
   - Select **Delete** from the Edit menu
   - Click the right mouse button, then select **Delete** from the pop-up menu
   - Click on the Erase icon in the Edit toolbar.

     RSWare displays a message box asking you if you wish to continue.
3. Select **OK** to paste or **Cancel**.

Drag and Drop

You can use the drag-and-drop method to copy and move a Workspace window branch or item to other locations within the Workspace window. The drag-and-drop method combines the Cut, Copy and Paste commands, as follows:

- the drag-and-drop method copies a Workspace window branch or item that can be both copied using the Copy command, and pasted using the Paste command.
- the drag-and-drop method moves a Workspace window branch or item that can be both cut using the Cut command, and pasted using the Paste command.

To use the drag-and-drop method to copy a Workspace window branch or item:

1. Place the cursor arrow on a Workspace window branch or item that can be copied and hold down the left mouse button
2. Drag the selected Workspace window branch or item to the desired destination. One of two things happens:
   - If the item can be copied, the pointer continues to appear as an arrow and a + (plus) sign appears to the right of the arrow (for as long as you continue drag the item over a place in the Workspace window where it may be dropped).
   - If the item cannot be copied, or if you are dragging the item over a part of the Workspace window where it may not be dropped, the arrow is replaced by a circle with a line through it.
3. Release the mouse button when you arrive at the Workplace window location where you want to copy the Workspace window branch or item. The result is the same as if you had Copied then Pasted it to this location.

To use the drag-and-drop method to move a Workspace window branch or item:

1. Place the cursor arrow on a Workspace window branch or item that can be cut and hold down the left mouse button

2. Drag the selected Workspace window branch or item to the desired destination. One of two things happens:

   - If the item can be cut, the pointer continues to appear as an arrow (for as long as you continue drag the item over a place in the Workspace window where it may be dropped).

   - If the item cannot be cut, or if you are dragging the item over a part of the Workspace window where it may not be dropped, the arrow is replaced by a circle with a line through it.

3. When you arrive at the Workplace window location where you want to move the item, release both the mouse button and the Ctrl key. The result is the same as if you had Cut then Pasted it to this location.

Examining the CSD5 Drive Interface

Chapter Overview

A CSD5 drive may be set up in one of several operational modes.

- Analog Velocity Controller
- Analog Current Controller
- Preset Velocity Controller
- Position Follower using an Auxiliary Encoder
- Position Follower using Step and Direction controls
- Position Follower Step Up and Step Down controls
- Indexing Controller

The CSD5 drive interface also provides Homing, Oscilloscope, drive Tuning and Monitor capabilities, and Motor and Encoder Diagnostic routines.

This chapter covers:

- Configuring an CSD5 Drive
- Understanding the CSD5 Drive Branch
- Understanding the Analog Window
- Understanding the Preset Window
- Understanding the Follower Window
- Understanding the Indexing Window
- Understanding the Homing Window
- Understanding the Motor Window
- Understanding the Tuning Window
- Understanding the Encoders Window
- Understanding the Digital Inputs Window
- Understanding the Digital Outputs Window
- Understanding the Analog Outputs Window
- Understanding the Monitor

- Understanding the Oscilloscope Window
- Understanding CSD5 Statuses
- Understanding the Faults Window
- Understanding the Service Information Window

Configuring an CSD5

Each CSD5 drive in the Workspace window has the following child branches or windows:

- Operation Modes
  -Analog
  -Preset
  -Follower
  -Indexing
  -Homing
- Motor
- Tuning
- Encoders
- Digital Inputs
- Digital Outputs
- Analog Outputs
- Monitor
- Oscilloscope
- Faults
- Service Information

Except for the Monitor windows, all of a drive's child branches can and must be configured in a Properties window.

Configuring Properties for the CSD5 Drive

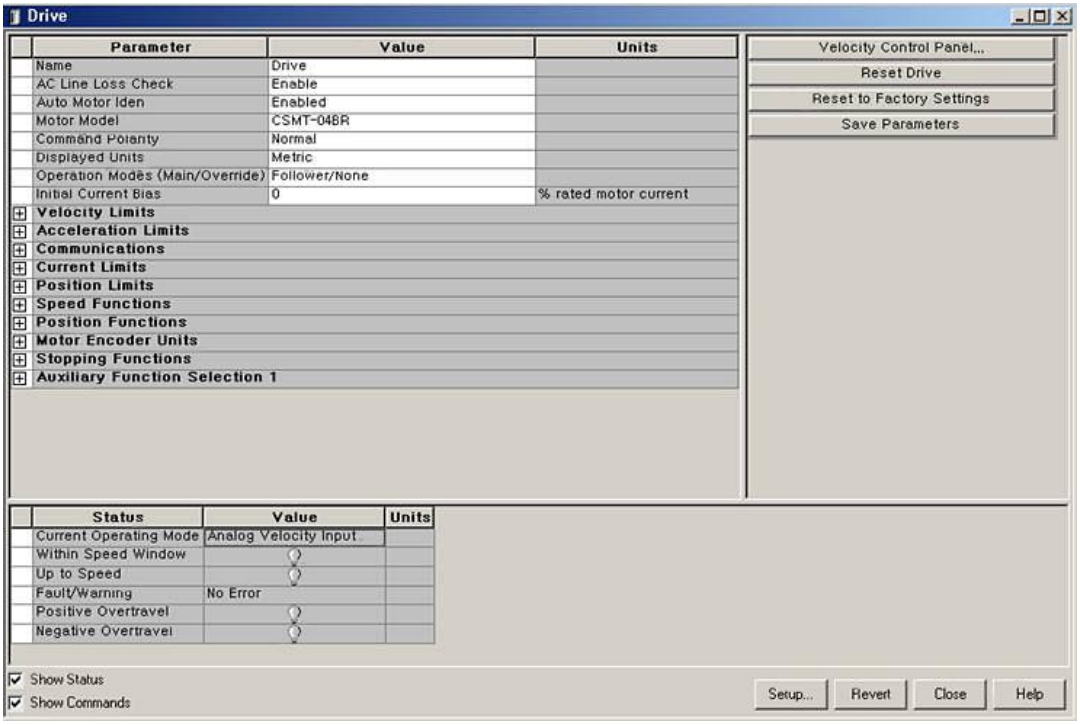
To configure the properties for an CSD5 drive or one of its child branches:

1. In the Workspace window, select the drive branch to configure.
2. Do one of the following:
   - Select **Properties…** from the Edit menu.

- Click the right mouse button and select **Properties…** from the pop-ip menu.
- Double click on the selected drive branch.

A properties window, such as the Drive Properties window display below, appears for the selected branch.

Note: The Properties window of CSD5 Drive and KNX3 Drive are not same. The below is an illustration of CSD5 Drive.



3. To configure properties for the selected drive branch, use the features of the Properties window as follows:

Section	Description
Parameters	Located in the upper left part of the Properties window. Type or select values in the parameter fields to configure the settings of the selected drive branch.
Commands	Located in the upper right part of the Properties window. Click a button to issue the associated command. Select **show Commands**, below, to display command buttons. Not every drive branch has associated commands.

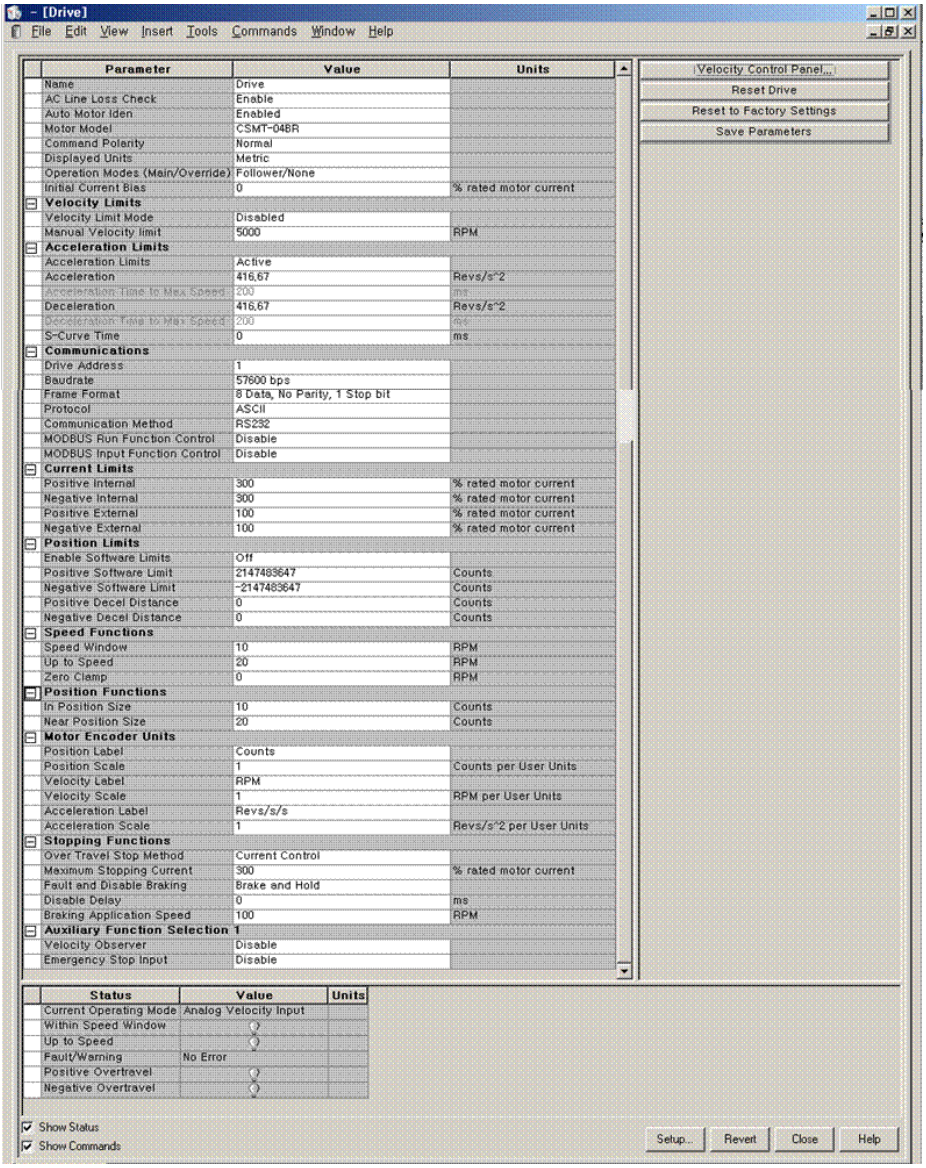
Statuses	Located beneath the Parameters and Commands sections. By default, these fields display the on-line status of the selected drive branch. Click on **Setup** to open a window where you can customize the statuses to be displayed. Status fields are read-only. Select **Show Status** to display the status section. Note: Status values for off-line drives may not be meaningful.
Show Status	Select this to display statuses for the selected drive branch.
Show Command	Select this to display commands for the selected drive branch. Commands can be executed only for on-line drives. This selection is grayed-out if no commands are associated with the selected drive branch.
Setup	Opens the Monitor Setup window, where you can customize the Statuses that are displayed. Refer to Understanding the Monitor on page 111 for more information about using the Monitor window.
Revert	Click this button to return parameter settings to the values they had when you first opened this window.
Close	Closes the window.
Help	Click this button to get online help for this window.

The remainder of this chapter describes the process of entering and editing drive configuration settings, the statuses that are displayed by default for each drive branch when the drive is on-line, and the commands available to a user for each drive branch when the drive is on-line.

CSD5 Drive Branch

The Properties window for the CSD5 Drive branch looks like this:

Note: The Properties window of CSD5 Drive and KNX3 Drive are not same. The below is an illustration of CSD5 Drive.



Use this CSD5 window to:

- configure the parameters for an off-line or an on-line drive
- monitor the status of an on-line drive
- execute commands that clear faults, reset the drive or reset the EEPROM
- open the Control Panel windows, where you can issue commands that control drive motion

You can edit parameters for both an on-line and an off-line drive. However, you can monitor statuses (i.e., executed through the RSWare interface) only for a CSD5 drive in the On-Line Drives branch.

The following parameters apply to the CSD5 Drive window:

Drive - Name	
Description	The name of the drive. Note: The drive name is displayed in the title bar of the windows relating to this drive.
Parameter	-
Range:	up to 32 characters long.
Default:	Drive
Applicable Operating Mode	All
When Enabled	Immediately

Drive - AC Line Loss Check			
Description	Select main power input source		
Parameter	[Ft – 0.02]- Digit 3		
Range:	Select	Description	Value
	Enable.	50~400W drive: Enable single-phase open check 0.8~1.5kW drive :Enable 3-phase open check	0x0
	Disable	Do not check the input power	0x1
	Single phase input	Single-phase input	0x2
Default:	Enable		
Applicable Operating Mode	All		
When Enabled	Servo-Off -> Setting		

Drive - Motor Model	
Description	Set Motor type Set three items of the motor: motor type, motor rated output, and encoder type.
Parameter	[Ft – 0.01]
Range:	
Default:	CSMT-04BR for CSD5 Drive; CSM-A3BB for KNX3 Drive
Applicable Operating Mode	All
When Enabled	Servo-Off -> Setting -> After power cycle

Drive - Command Polarity			
Description	Direction of Motor Rotation		
Parameter	[Ft – 0.02]- Digit 2		
Range:	Select	Description	Value
	Normal	The command signal is not inverted so that a positive command value results in CW Rotation, (as viewed from shaft end).	0x0
	Inverted	The command signal is inverted so that a positive command value results in CCW Rotation, (as viewed from shaft end).	0x1
Default:	Normal		
Applicable Operating Mode	All		

When Enabled	Servo-Off -> Setting

Drive - Displayed Units			
Description	Select a unit of measure for position, velocity, and acceleration displays		
Parameter	-		
Range:	Select	Description	Value
	Metric	units for rotary motors are: counts (position), RPM (velocity), revs/ sec² (acceleration);units for linear motors are: meters (position), meters/ sec² (velocity), and meters/ sec² (acceleration).	-
	English	units for rotary motors are: counts (position), RPM(velocity), revs/sec²(acceleration); units for linear motors are: inches (position), inches/sec2(velocity), and inches/sec2(acceleration).,	-
	User	displays measurements in terms defined by the user in the Units section.	-
Default:	Metric		
Applicable Operating Mode	All		
When Enabled	Servo-Off -> Setting		

Drive - Operation Modes (Main/Override)			
Description	Select the combination of operation modes to be used when the Operation Mode Override digital input is active or inactive.		
Parameter	[Ft – 0.00]		
Range:	Select	Description	Value
	Follower/None	Position control mode	F(1)
	Analog Velocity Input/ None	Speed control mode	S(2)
	Analog Current Input/ None	Torque control mode	C(3)
	Analog Velocity Input/ Follower	Speed + position mode	SF(4)
	Analog Velocity Current/ Follower	Torque + position control mode	CF(5)
	Analog Current Input/Analog Velocity Input	Torque + speed control mode	CS(6)
	Preset Velocity / None	Multi-step speed control mode	P(7)
	Preset Velocity / Follower	Multi-step speed + position control mode	PF(8)
	Preset Velocity/Analog Velocity Input	Multi-step speed + speed control mode	PS(9)
	Preset Velocity/Analog Current Input	Multi-step speed +Torque control mode	PC(10)
	Indexing Input/ None	Indexing	I(12)
Default:	Follower/None		

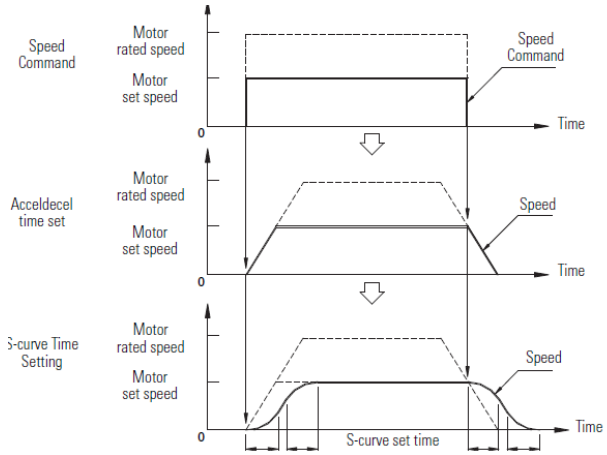
Applicable Operating Mode	All
When Enabled	Servo-Off -> Setting -> After power cycle

Drive - Initial Current Bias	
Description	Initial torque value applied when the servo drive activated. Prevents the downturn of vertical load during initial operation
Parameter	[Ft – 4.06]
Range:	-100~100
Default:	0
Units:	% of motor rated continuous current
Applicable Operating Mode	All
When Enabled	Immediately

Drive - Velocity Limits			
Drive - Velocity Limits - Velocity Limit Mode			
Description	Specifies the method for limiting the motor velocity within the motor's rated maximum velocity. The drive will never exceed the motor's rated maximum velocity. This setting can be used to restrict the motor velocity further.		
Parameter	[Ft – 2.13]		
Range:	Select	Description	Value
	Disabled	Motor's rated maximum velocity	0x0
	Manual Limit	Limited by "Manual Velocity limit" (Ft-2.12).	0x1
	Analog Input	Limited by Analogue Speed Command Value (except Analog Speed Mode).	0x2
	Manual and Analog	Limited by lesser one between "Manual Velocity limit" (Ft-2.12) and Analogue Speed Command.	0x3
Default:	Disabled		
Applicable Operating Mode	All		
When Enabled	Servo-Off -> Setting		
Drive - Velocity Limits - Manual Velocity limit			
Description:	• Limits the operation speed to below this set value in all control modes. . • There are two methods of speed limitation: limitation thorough this value and limitation through speed command of upper level controller. Configure by referring to speed limit method selection of [Ft-2.13]. • In addition, in torque control mode, the mode is changed automatically to speed control mode if motor speed exceeds this value; speed control is performed using limit speed command. • If the analog speed command exceeds motor's maximum speed, the excessive speed command warning "OSC" is issued. • If excessive speed command warning is issued, the speed command is automatically reduced to the motor's maximum speed.		
Parameter:	[Ft – 2.12]		
Range:	1~6000		
Default:	5000		
Units:	RPM for rotary motors, mm/sec for linear motors		

Applicable Operating Mode:	Follower, Analog Velocity, Preset
When Enabled	Servo-Off -> Setting

Drive -Acceleration Limits			
Drive -Acceleration Limits-Acceleration Limits			
Description	Sets the state of the Acceleration and Deceleration Limits in the drive, for the Analog Velocity and Preset Velocity operation modes.		
Parameter:	-		
Range:	Select	Description	Value
	Inactive	Inactive	-
	Active	Active	-
Default:	Active		
Applicable Operating Mode	All		
When Enabled	Servo-Off -> Setting		
Drive - Acceleration Limits - Acceleration			
Description:	Acceleration means slope of the Speed Profile.		
Parameter:	[Ft – 2.02]		
Range:	0.01 ~ 21,474,836.47for rotary,1~2147483647 for linear		
Default:	416.67for rotary, 41667 for linear		
Units:	Rev/sec^2 for rotary, mm/sec^2 for linear		
Applicable Operating Mode:	Analog Velocity Input, Preset Velocity		
When Enabled	Immediately		
Drive - Acceleration Limits - Deceleration			
Description:	Deceleration means slope of the Speed Profile.		
Parameter:	[Ft – 2.03]		
Range:	0.01 ~ 21,474,836.47for rotary,1~2147483647 for linear		
Default:	416.67for rotary, 41667 for linear		
Units:	Rev/sec^2 for rotary, mm/sec^2 for linear		
Applicable Operating Mode:	Analog Velocity Input, Preset Velocity		
When Enabled	Immediately		
Drive - Acceleration Limits - S-Curve Time			

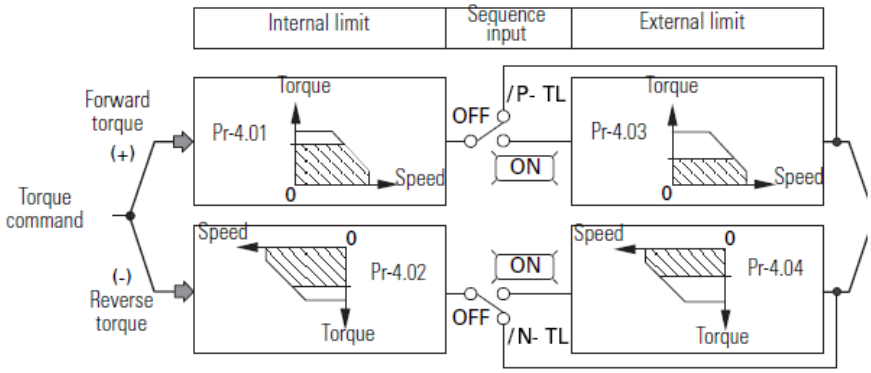
Description:	S-operation time set for smooth operation • Applied only when acceleration/deceleration time have been set. If value is set to '0', S-operation is not performed; if a value other than '0' is set, S-operation is performed on acceleration/ deceleration. 
Parameter:	[Ft – 2.04]
Range:	0~5000
Default:	0
Units:	ms
Applicable Operating Mode:	All
When Enabled	Immediately

Drive - Communications			
Drive - Communications - Drive Address			
Description:	The drive's communication port address		
Parameter:	[Ft – 0.07]		
Range:	1~247		
Default:	1		
Applicable Operating Mode	All		
When Enabled	Immediately		
Drive - Command Polarity			
Description	Select the motor's rotation direction		
Parameter	[Ft – 0.02]- Digit 2		
Range:	Select	Description	Value
	Normal	The command signal is not inverted so that a positive command value results in CW Rotation, (as viewed from shaft end).	0x0
	Inverted	The command signal is inverted so that a positive command value results in CCW Rotation, (as viewed from shaft end).	0x1
Default:	Normal		
Applicable Operating Mode	All		
When	Servo-Off -> Setting		

Enabled			
Drive - Communications - Baudrate			
Description	Select a baud rate for the drive. Note: This parameter is supported for CSD5 drive. There are two types of Baudate for KNX3 Drive. RS-485 Port Baudrate and RS-232C Port Baudrate should be selected respectively.		
Parameter	[Ft – 0.09]- Digit 0		
Range:	Select	Description	Value
	9600bps	9600bps	0x0
	14400bps	14400bps	0x1
	19200bps	19200bps	0x2
	38400bps	38400bps	0x3
	56000bps	56000bps	0x4
	57600bps	57600bps	0x5
Default:	57600bps		
Applicable Operating Mode	All		
When Enabled	Immediately		
Drive - Communications - Frame Format			
Description	Select the drive's communications port packet framing format.		
Parameter	[Ft – 0.09]- Digit 1		
Range:	Select	Description	Value
	8 Data, No Parity, 1 Stop bit	8, No, 1	0x0
	8 Data, Even Parity, 1 Stop bit	8, Even, 1	0x1
	8 Data, Odd Parity, 1 Stop bit	8, Odd, 1	0x2
	8 Data, No Parity, 2 Stop bit	8, No, 2	0x3
	8 Data, Even Parity, 2 Stop bit	8, Even, 2	0x4
	8 Data, Odd Parity, 2 Stop bit	8, Odd, 2	0x5
Default:	8 Data, No Parity, 1 Stop bit		
Applicable Operating Mode	All		
When Enabled	Immediately		
Drive - Communications - Protocol			
Description	Select the drive’s communications protocol		
Parameter	[Ft – 0.09]- Digit 2		
Range:	Select	Description	Value
	ASCII	ASCII	0x0
	MODBUS-RTU	MODBUS-RTU	0x1
Default:	ASCII		
Applicable Operating Mode	All		
When Enabled	Immediately		

Drive - Communications - Communication Method			
Description	Select the drive's communications Method. Note: This parameter is only supported for CSD5 drive.		
Parameter	[Ft – 0.09]- Digit 3		
Range:	Select	Description	Value
	RS232	RS232	0x0
	RS485	RS485	0x1
Default:	RS232		
Applicable Operating Mode	All		
When Enabled	Immediately		
Drive - Communications - MODBUS Run Function Control			
Description	It is used for selection of run-xx or Input function using Modbus. Run function cannot be used by key pad, similarly, if the run function is used by Modbus. Note: This parameter is only supported for CSD5 drive.		
Parameter	[Ft – 0.32]- Digit 1		
Range:	Select	Description	Value
	Disable	Not use both Run and Input function by Modbus	0x0
	Enable	Use run function only	0x1
Default:	Disable		
Applicable Operating Mode	All		
When Enabled	Servo-Off -> Setting		
Drive - Communications - MODBUS Input Function Control			
Description	It is used for selection of Input function using Modbus. Input function on Hardware cannot be used in case that the input function is used by Modbus with this parameter. Note: This parameter is only supported for CSD5 drive.		
Parameter	[Ft – 0.32]- Digit 0		
Range:	Select	Description	Value
	Disable	Not use both Run and Input function by Modbus	0x0
	Enable	Use Input function only	0x1
	Disable + Special Function	use both Run and Input function by Modbus	0x2
Default:	Disable		
Applicable Operating Mode	All		
When Enabled	Servo-Off -> Setting		

Drive - Current Limits	
Drive - Current Limits - Positive Internal	
Description	It limits positive torque in [%] unit related to rated torque. (internally limited)
Parameter	[Ft – 4.01]
Range:	0~500
Default:	300

Units:	% of motor rated continuous current
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Current Limits - Negative Internal	
Description	It limits positive torque in [%] unit related to rated torque. (Internally limited)
Parameter	[Ft – 4.02]
Range:	0~500
Default:	300
Units:	% of motor rated continuous current
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Current Limits - Positive External	
Description	• The torque imposed on the motor is internally limited automatically by the values set on [Ft-4.01], [Ft-4.02]. Additionally, it is also limited by the values set on [Ft-4.03], [Ft-4.04] when external </P-TL>, </N-TL> signals are input through sequence input. • The torque limit according to internal limit [Ft-4.01] and [Ft-4.01] takes precedence to external torque limit </P-TL> and </N-TL> signals. • If </P-TL> is ON, it limits positive torque in [%] unit related to rated torque. 
Parameter	[Ft – 4.03]
Range:	0~500
Default:	100
Units:	% of motor rated continuous current
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Current Limits - Negative External	
Description	If </N-TL> is ON, it limits negative torque in [%] unit related to rated torque.
Parameter	[Ft – 4.04]
Range:	0~500
Default:	100
Units:	% of motor rated continuous current

Applicable Operating Mode:	All
When Enabled	Immediately

Drive - Position Limits			
Drive - Position Limits- Enable Software Limits			
Description	Select the software overtravel monitor enablement.		
Parameter	[IN 00.04]		
Range:	Select	Description	Value
	Off	Turns off software overtravel limit checking	0x0
	On	Causes the drive to compare the motor feedback position to the Positive and Negative Software Limits, below, to determine if the drive has exceeded an overtravel limit.	0x1
Default:	Off		
Applicable Operating Mode	Indexing		
When Enabled	Disable drive		
Drive - Position Limits- Positive Software Limit			
Description	If the motor feedback position is greater than this value, the drive has exceeded the software overtravel limit.		
Parameter	[IN 00.05]		
Range:	-2,147,483,647~2,147,483,647		
Default:	2,147,483,647		
Applicable Operating Mode	Indexing		
When Enabled	Disable drive		
Drive - Position Limits- Negative Software Limit			
Description	If the motor feedback position is less than this value, the drive has exceeded the software overtravel limit		
Parameter	[IN 00.06]		
Range:	-2,147,483,647~2,147,483,647		
Default:	-2,147,483,647		
Applicable Operating Mode	Indexing		
When Enabled	Disable drive		
Drive - Position Limits- Positive Decel Distance			
Description	The stopping distance used when the drive encounters a positive overtravel limit.		
Parameter	[IN 00.02]		
Range:	0~2,147,483,647		
Default:	0		
Applicable Operating Mode	Indexing		
When Enabled	Always		

Drive - Position Limits- Negative Decel Distance	
Description	The stopping distance used when the drive encounters a negative overtravel limit.
Parameter	[IN 00.03]
Range:	0~2,147,483,647
Default:	0
Applicable Operating Mode	Indexing
When Enabled	Always

Drive -Speed Functions	
Drive -Speed Functions - Speed Window	
Description	If the speed error < Speed Window for 10 ms and the Within Speed Window output signal is assigned, then the Within Speed Window output is turned ON
Parameter	[Ft-5.03]
Range:	0-1000
Default:	10
Units:	RPM for rotary motors, mm/sec for linear motors
Applicable Operating Mode:	Follower, Analog Velocity Input, Preset Velocity
When Enabled	Immediately
Drive -Speed Functions - Up to Speed	
Description	If the motor speed > Up to Speed and the Up to Speed output signal is assigned, then the Up to Speed output is turned ON.
Parameter	[Ft-5.04]
Range:	1~5000
Default:	20
Units:	RPM for rotary motors, mm/sec for linear motors
Applicable Operating Mode:	All
When Enabled	Immediately
Drive -Speed Functions - Up to Speed	
Description	If the Analog Speed Command < Zero Clamp, then the analog speed command is ignored and the motor command speed is set to zero.
Parameter	[Ft-5.05]
Range:	0~5000
Default:	0
Units:	RPM for rotary motors, mm/sec for linear motors
Applicable Operating Mode:	Analog Velocity
When Enabled	Immediately

Drive -Position Functions
Drive -Position Functions - In Position Size

Description	If position error < In Position Size for 1 ms and the In Position Size output signal is assigned, the In Position output is turned ON.
Parameter	[Ft-5.00]
Range:	0~2500
Default:	10
Units:	Counts
Applicable Operating Mode:	Follower
When Enabled	Immediately
Drive -Position Functions - Near Position Size	
Description	If position error < Near Position Size and the Near Position output signal is assigned, the Near Position output is turned ON
Parameter	[Ft-5.02]
Range:	0~2500
Default:	20
Units:	Counts
Applicable Operating Mode:	Follower
When Enabled	Immediately

Drive -Motor Encoder Units	
Drive - Motor Encoder Units - Position Label	
Description	When **User** is selected for Displayed Units, above, this is the user-defined label for position values relating to the motor encoder.
Parameter	-
Range:	Limited to 16 characters in length
Default:	Counts
Units:	-
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Motor Encoder Units - Position Scale	
Description	When **User** is selected for Displayed Units, above, this is the user-defined conversion factor used to convert position values, relating to the motor encoder, into user units. In Counts per User Unit.
Parameter	-
Range:	-
Default:	1
Units:	In Counts per User Unit
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Motor Encoder Units - Velocity Label	
Description	When **User** is selected for Displayed Units, above, this is the user-defined label for velocity values relating to the motor encoder.

Parameter	
Range:	Limited to 16 characters in length
Default:	RPM
Units:	-
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Motor Encoder Units - Velocity Scale	
Description	When **User** is selected for Displayed Units, above, this is the user-defined conversion factor used to convert velocity values, relating to the motor encoder, into user units. In Counts per second per User Unit.
Parameter	-
Range:	-
Default:	1
Units:	RPM
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Motor Encoder Units - Acceleration Label	
Description	When **User** is selected for Displayed Units, above, this is the user-defined label for acceleration values relating to the motor encoder. Limited to 16 characters in length.
Parameter	-
Range:	-
Default:	Revs/s/s
Units:	
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Motor Encoder Units - Acceleration Label	
Description	When **User** is selected for Displayed Units, above, this is the user-defined conversion factor used to convert acceleration values, relating to the motor encoder, into user units. In Counts per second squared per User Unit.
Parameter	-
Range:	-
Default:	1
Units:	Revs/s^2 per User Units
Applicable Operating Mode:	All
When Enabled	Immediately

Drive - Stopping Functions			
Drive - Stopping Functions - Over Travel Stop Method			
Description	Set stopping current with Over travel Current limit parameter		
Parameter	[Ft-0.02]-Digit 1		
Range:	Select	Description	Value

	Current Control	Stop the motor while continuing the normal torque control.	0x0
	Dynamic Brake	Stops at "Dynamic Brake" in the mode selected	0x1
Default:	Current Control		
Applicable Operating Mode	All		
When Enabled	Servo-Off -> Setting		
Drive - Stopping Functions - Maximum Stopping Current			
Description	•Limits the torque imposed on the motor if the motor is halted by overtravel (<P-OT>,<N-OT>) input signal during rotation. •Unlike external and internal torque limit, the torque limit value for overtravel input is same for forward and reverse direction.		
Parameter	[Ft-4.05]		
Range:	0~500		
Default:	300		
Units	% of motor rated continuous current		
Applicable Operating Mode	All		
When Enabled	Immediately		
Drive - Stopping Functions - Fault and Disable Braking			
Description	Set the Dynamic Brake(DB) stop method		
Parameter	[Ft-0.02]-Digit 0		
Range:	Select	Description	Value
	Brake and hold	DB stop is maintained even after the complete stop.	0x0
	Brake and release	DB Stop. DB operation is released after the complete stop.	0x1
	Free stop	The DB is not used, but free run stop.	0x2
	Free stop and hold	Free run stop. DB operation is maintained after the complete stop.	0x3
Default:	Brake and hold		
Applicable Operating Mode	All		
When Enabled	Servo-Off -> Setting		
Drive - Stopping Functions - Disable Delay			
Description	Disable Delay is the time from when Drive Disable command is received to when the Drive Disable command is actually executed.		
Parameter	[Ft-5.07]		
Range:	0~10000		
Default:	0		
Units:	ms		
Applicable Operating Mode:	All		
When	Servo-Off -> Setting		

Enabled	
Drive - Stopping Functions - Braking Application Speed	
Description	The Braking Application Speed is the feedback speed below which the motor break is engaged, after disabling the drive.
Parameter	[Ft-5.09]
Range:	0~10000
Default:	100
Units:	RPM for rotary motors, mm/sec for linear motors
Applicable Operating Mode:	All
When Enabled	Servo-Off -> Setting

Drive - Auxiliary Function Selection 1			
Drive - Auxiliary Function Selection 1- Velocity Observer			
Description	Selection of velocity monitor use, When high resolution encoder is used by activating velocity monitor, the speed ripple occurring at low velocity operation can be reduced.		
Parameter	[Ft-0.05]-Digit 1		
Range:	Select	Description	Value
	Disable	Disable	0x0
	Enable	Enable	0x1
Default:	Disable		
Applicable Operating Mode	All		
When Enabled	Servo-Off -> Setting -> After power cycle		
Drive - Auxiliary Function Selection 1- Emergency Stop Input			
Description	Select the emergency stop input enablement		
Parameter	[Ft-0.05]-Digit 3		
Range:	Select	Description	Value
	Disable	Disable	0x0
	Enable	Enable	0x1
Default:	Disable		
Applicable Operating Mode	All		
When Enabled	Servo-Off -> Setting -> After power cycle		

The following statuses are displayed by default for an CSD5 drive in the On-Line Drives branch of the Workspace window:

Status	Description
Note: All ON statuses have a value of 1; all OFF statuses have a value of 0.	
Current Operating Mode	ON indicates the current of operating mode setting.

Within Position Window	ON indicates position error has been less than the In Position Size setting for longer than the In Position Time setting.
Up to Speed	ON indicates motor velocity feedback is greater than the Up To Speed setting.
Fault/Warning	If no error, it indicates "no error".
Positive Overtravel	ON indicates positive overtravel limit sensor is detected or position feedback exceeds positive software overtravel limit in case of using indexing mode.
Negative Overtravel	ON indicates negative overtravel limit sensor is detected or position feedback exceeds negative software overtravel limit in case of using indexing mode.

The following commands can be executed for an CSD5 Drive window that is located in the On-Line Drives branch. These commands are explained in the following sections:

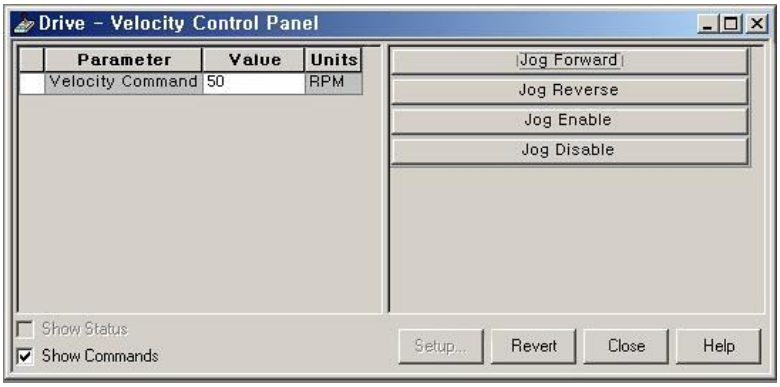
Status	Description
Velocity Control Panel	Opens the Velocity Control Panel window. Refer to Velocity Control Panel Window on page 44 for more information about how to set a drive's velocity command and monitor its motor velocity or current.
Reset Drive	Resets, or reboots, the hardware and firmware for a drive.
Reset to Factory settings	Resets a drive's parameters by reinitializing them to factory default settings. Stored faults and the Time in Service clock remain unchanged
Save parameters	Save parameters

Customize the window for your CSD5 Drive branch by selecting one or more of the following buttons:

- Toggle the **Show Status** selection to display or hide the Status pane.
- Toggle the **Show Commands** selection to display or hide the Commands pane.
- Click on the **Setup** button to open the Monitor Setup window as shown on page 112, where you can customize the status display for this window.
- Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Velocity Control Panel Window

The Properties window for the Velocity Control Panel looks like this:



Note: The command buttons (Jog Forward/Reverse/Enable/Disable) can be displayed for CSD5 Drive window that is located in the On-Line Drive branch.

Use the Velocity Control Panel window to directly set the drive's velocity command. In support of these functions, you can also:

- Jog Forward/Jog Reverse
- Jog /Enable or Jog/Disable

The commands you execute override any motion commands originating from the drive's normal operation mode, set in the CSD5 Drive window.

ATTEN- 	The Velocity Control Panel commands override the normal operation mode. The motor moves in response to Velocity Control Panel commands!

The Velocity Control Panel has the following parameters, statuses and direct commands:

Drive - (Right side)Velocity Control Panel – Velocity Command	
Description	Sets speed for jog operation using (run-00). The speed, at which the motor turns when the Velocity Mode command executes, provided that the drive is on-line and enabled. Note: The drive ramps up, or ramps down, to the commanded velocity at the rate of acceleration set in the Acceleration input box.
Parameter	[Ft-2.01]
Range:	0~6000
Default:	50
Units:	RPM for rotary motors, mm/sec for linear motors
Applicable Operating Mode:	All
When Enabled	Immediately

The following commands can be executed from the Velocity Control Panel window of an on-line drive:

Commands	Description
Jog Forward	Move forward direction
Jog Reverse	Move reverse direction
Jog Enable	Enables the power stage of a drive
Jog Disable	Disables the power stage of a drive.

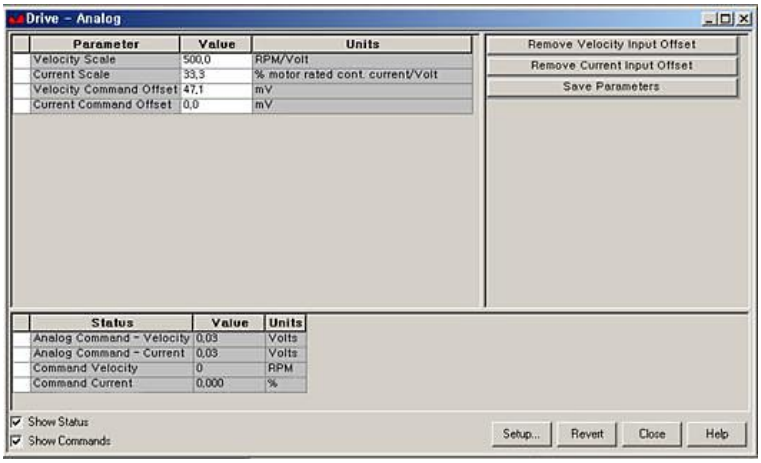
Customize the Velocity Control Panel window for your CSD5 Drive by selecting one or more of the following buttons:

- Toggle the **Show Commands** selection to display or hide the Commands pane.
- Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Understanding the Analog Window

The Properties window for the Analog branch looks like this:

Note: The Properties window for Analog of CSD5 Drive and KNX3 Drive are not same. The below is an illustration of CSD5 Drive.



Use the Analog window to:

- set Analog Velocity, Current and Command Input drive parameters for an on-line or off-line drive,
- monitor the status of the incoming Analog Command for an on-line drive, and
- execute commands that remove Velocity, Current and Input Offsets for an on-line drive.

These parameters govern drive operations when the Operating Mode is set to Analog Velocity Input, or Analog Current Input, in the window.

Drive - Mode Configuration - Analog	
Drive - Mode Configuration - Analog- Velocity Scale	
Description	• Sets the speed command value[rpm] for the analog speed command input pin(Pin 19,20 of I/O) • Speed command[rpm] = Ft-2.00 [rpm/V] x Input voltage[V]
Parameter	[Ft-2.00]
Range:	10.0~2000.0
Default:	500.0
Units:	RPM/V for rotary motors, mm/sec for linear motors
Applicable Operating Mode:	Analog Velocity
When Enabled	Servo-Off -> Setting
Drive - Mode Configuration - Analog- Current Scale	
Description	• Set the speed command value[%] for 1[V] on the analog torque command input pin(pin 21,22 of I/O) • Torque command[%] = [Ft-4.00] [%/V] x input voltage[V]
Parameter	[Ft-4.00]
Range:	0-100
Default:	33.3
Units:	% of motor rated continuous current/Volt
Applicable Operating Mode:	Analog Current Command, Dual Current Command
When Enabled	Servo-Off -> Setting
Drive - Mode Configuration - Velocity Command Offset	
Description	The drive's velocity input offset value. This value indicates the offset of the Analog Command Input.
Parameter	-
Range:	-10,000~10,000
Default:	0.0
Units:	mV
Applicable Operating Mode:	Analog Velocity Command
When Enabled	Servo-Off -> Setting
Drive - Mode Configuration - Current Command Offset	
Description	The drive's current input offset value. This value indicates the offset of the Analog Command Input.
Parameter	-
Range:	-10,000~10,000
Default:	0.0
Units:	mV
Applicable Operating Mode:	Analog Velocity Command
When Enabled	Servo-Off -> Setting

You can edit Analog parameters for both an on-line and an off-line drive. However, you can monitor statuses and execute direct commands (i.e.,

executed through the RSWare interface) only for a Analog window that is the child of an on-line drive.

The following status is displayed by default for an Analog window of an on-line drive:

Status	Description
Analog Command - Velocity	External Analog Velocity Command
Analog Command - Current	External Analog Current Command
Command Velocity	Actual Velocity Command
Command Current	Actual Current Command

The following commands can be executed for an Analog window that is located in the On-Line Drives branch:

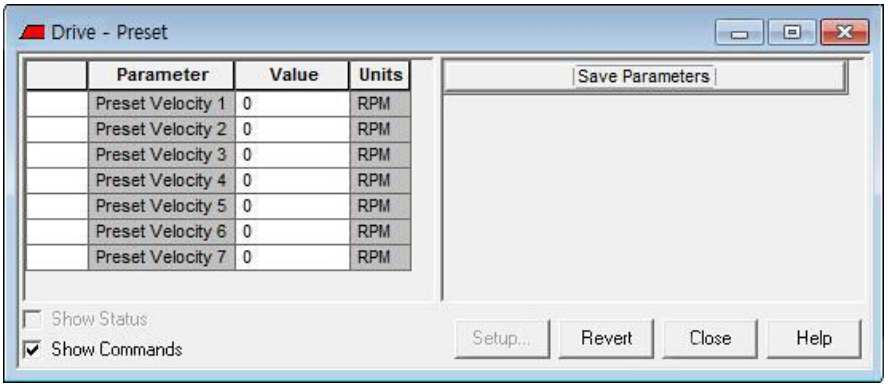
Commands	Description
Remove Velocity Input Offset	This command automatically measures the existing offset of the Analog Command Input, and resets the Velocity Offset value to eliminate the offset.
Remove Current Input Offset	This command automatically measures the existing offset of the Analog Command Input, and resets the Current Offset value to eliminate the offset.
Save parameters	Save parameters

Customize the Analog window for your CSD5 Drive branch by selecting one or more of the following buttons:

- Toggle the **Show Status** selection to display or hide the Status pane.
- Toggle the **Show Commands** selection to display or hide the Commands pane.
- Click on the **Setup** button to open the Monitor Setup window as shown on page 112, where you can customize the status display for this window.
- Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Understanding the Preset Window

The Properties window for Presets looks like this:



Use the Preset window to configure:

- up to seven preset velocity values

Preset parameters control drive operation when the Operating Mode is set to Preset Velocity in the CSD5 Drive window.

The drive uses the preset velocity value selected by the Preset Select Lines 0, 1 and 2 as set in the Digital Inputs properties window.

The digital input's Preset Select Line binary values are as follows:

- Preset Select 0 = 1 if active, 0 if not.
- Preset Select 1 = 2 if active, 0 if not.
- Preset Select 2 = 4 if active, 0 if not.

If a Preset Select Line is not assigned to a digital input, the Preset Select Line is considered inactive.

If you only want to use a single gear ratio, simply set up the Gear Ratio for Preset 0, and don't assign the Preset Select 0, 1 or 2 to any digital inputs.

Note: Binary values for an active digital input's Preset Select Lines 3, 4 and 5 do not apply to this calculation.

The Preset window has no associated statuses or direct commands. The Preset window has the following parameters:

Drive - Mode Configuration - Preset	
Drive - Mode Configuration - Preset - Preset Velocity 1	
Description	• Sets each contact speed commands for contact speed control mode • The operation speed should be entered in advance into the relevant parameters </C-SP1>, </C-SP2>, </C-SP3>. • According to combination of the sequence input signals </C-SP1>, </C-SP2>, </C-SP3>, operation at preset speed is possible. • In addition, sequence input signal </C-DIR> is used to change the rotation direction of each speed command. • To reduce impact of speed change, set the acceleration/deceleration time to a sufficient value which should not interfere with system responsiveness
Parameter	[Ft-2.05]
Range:	-6000~6000

Default:	0
Units:	RPM for rotary motors, mm/sec for linear motors
Applicable Operating Mode:	Preset
When Enabled	Immediately

Table. Rotational speed depending on signals </C-SP1>, </C-SP2>, </C-SP3>.

Preset Velocity	Parameters	</C-SP3>	</C-SP2>	</C-SP1>
Stop Command	0(rpm)	0	0	0
Preset Velocity 1	Ft- 2.05	0	0	1
Preset Velocity 2	Ft- 2.06	0	1	0
Preset Velocity 3	Ft- 2.07	0	1	1
Preset Velocity 4	Ft- 2.08	1	0	0
Preset Velocity 5	Ft- 2.09	1	0	1
Preset Velocity 6	Ft- 2.10	1	1	0
Preset Velocity 7	Ft- 2.11	1	1	1

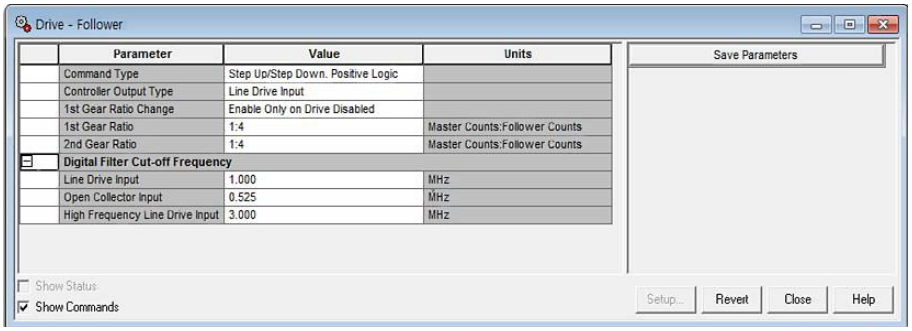
Drive - Mode Configuration - Preset - Preset Velocity 2	
Description	Refer to description of [Ft-2.05]
Parameter	[Ft-2.06]
Range:	-6000~6000
Default:	0
Units:	RPM for rotary motors, mm/sec for linear motors
Applicable Operating Mode:	Preset
When Enabled	Immediately
Drive - Mode Configuration - Preset - Preset Velocity 3	
Description	Refer to description of [Ft-2.05]
Parameter	[Ft-2.07]
Range:	-6000~6000
Default:	0
Units:	RPM for rotary motors, mm/sec for linear motors
Applicable Operating Mode:	Preset
When Enabled	Immediately
Drive - Mode Configuration - Preset - Preset Velocity 4	
Description	Refer to description of [Ft-2.05]
Parameter	[Ft-2.08]
Range:	-6000~6000
Default:	0
Units:	RPM for rotary motors, mm/sec for linear motors
Applicable Operating Mode:	Preset
When	Immediately

Enabled	
Drive - Mode Configuration - Preset - Preset Velocity 5	
Description	Refer to description of [Ft-2.05]
Parameter	[Ft-2.09]
Range:	-6000~6000
Default:	0
Units:	RPM for rotary motors, mm/sec for linear motors
Applicable Operating Mode:	Preset
When Enabled	Immediately
Drive - Mode Configuration - Preset - Preset Velocity 6	
Description	Refer to description of [Ft-2.05]
Parameter	[Ft-2.10]
Range:	-6000~6000
Default:	0
Units:	RPM for rotary motors, mm/sec for linear motors
Applicable Operating Mode:	Preset
When Enabled	Immediately
Drive - Mode Configuration - Preset - Preset Velocity 7	
Description	Refer to description of [Ft-2.05]
Parameter	[Ft-2.11]
Range:	-6000~6000
Default:	0
Units:	RPM for rotary motors, mm/sec for linear motors
Applicable Operating Mode:	Preset
When Enabled	Immediately

Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Understanding the Follower Window

The Properties window for Followers looks like this:



Follower parameters control drive operation when the Operating Mode is set to one of the following:

- Step Up/Step Down. Positive Logic
- Step Up/Step Down. Negative Logic
- Step/Direction. Positive Logic
- Step/Direction. Negative Logic
- Auxiliary Encoder. X1
- Auxiliary Encoder. X2
- Auxiliary Encoder. X4

in the CSD5 Drive window.

The Follower window has no associated statuses or direct commands. The Follower window has the following parameters:

Drive - Mode Configuration - Follower			
Drive - Mode Configuration - Follower - Command Type			
Description	Note: For Command types 0x4, 0x5, and 0x6: Motor Counts = Master Lines * MULT * …… ….. (4 * Para3.01) / Para3.02 where MULT is 1, 2 or 4 for command types 0x4, 0x5 and 0x6 respectively.		
Parameter	[Ft-3.00]-Digit0		
Range:	Select	Description	Value
	Step Up/Step Down, Positive logic	Step Up/Step Down, Positive logic	0x0
	Step Up/Step Down, Negative logic	Step Up/Step Down, Negative logic	0x1
	Step/Direction, Positive Logic	Step/Direction, Positive Logic	0x2
	Step/Direction, Negative Logic	Step/Direction, Negative Logic	0x3
	Auxiliary Encoder, x1	A phase + B phase, x1	0x4
	Auxiliary Encoder, x2	A phase + B phase, x2	0x5
	Auxiliary Encoder, x4	A phase + B phase, x4	0x6
Default:	Step Up/Step Down, Positive logic		
Applicable Operating Mode	Follower		
When Enabled	Servo-Off -> Setting		
Drive - Mode Configuration - Follower - Controller Output Type			

Description	Select the host controller output type		
Parameter	[Ft-3.00]-Digit1		
Range:	Select	Description	Value
	Line Drive Input	Use Low speed Line Drive Output in Host Controller for isolated electrical connection. (900kHz Max)	0x0
	Open Collector Input	Use Open Collector in Host Controller. (250kHz Max)	0x1
	High Frequency Line Drive Input	Use High Frequency Line Drive Output in Host Controller.(3MHz Max)	0x2
Default:	Line Drive Input		
Applicable Operating Mode	Follower		
When Enabled	Servo-Off -> Setting		
Drive - Mode Configuration - Follower - 1st Gear Ratio Change			
Description:	Select the drive state to make 1st gear ratio take effect		
Parameter	[Ft-3.00]-Digit3		
Range:	Select	Description	Value
	Enable Only on Drive Disabled	Enable Only on Drive Disabled	0x0
	Always Enable	Always Enable	0x1
Default:	Enable Only on Drive Disabled		
Applicable Operating Mode:	Follower		
When Enabled	Servo-Off -> Setting		
Drive - Mode Configuration - Follower - 1st Gear Ratio			
Description:	• Denominator of Electronic gear([Ft-3.01]) • Numerator of Electronic gear([Ft-3.02]) • By using the electronic gear function, the amount of motor rotation pr input command pulse can be set arbitrarily. • The following relationship has to be satisfied: No. of pulses per 1 motor rotation x Reduction ratio x 4 (Pr-3.02) • Maximum resolution=1/ ([No.of pulses per 1 motor rotation] x [Reduction ratio] x 4)		
Parameter	[Ft-3.01](Denominator of Electronic gear), [Ft-3.02](Numerator of Electronic gear)		
Range:	1~65535		
Default:	360:10000		
Units:	Master Counts : Follower Counts		
Applicable Operating Mode:	Follower		
When Enabled	Servo-Off -> Setting		
Drive - Mode Configuration - Follower – 2nd Gear Ratio			
Description:	• Denominator of 2nd Gear Ratio ([Ft-3.04]) • Numerator of 2nd Gear Ratio ([Ft-3.05]) • By using the electronic gear function, the amount of motor rotation pr input command pulse can be set arbitrarily. • The following relationship has to be satisfied: No. of pulses per 1 motor rotation x Reduction ratio x 4 (Ftr-3.02) • Maximum resolution=1/ ([No.of pulses per 1 motor rotation] x [Reduction ratio] x 4)		
Parameter	[Ft-3.04](Denominator of 2nd Gear Ratio), [Ft-3.05](Numerator of 2nd Gear Ratio)		
Range:	1~65535		
Default:	1:4		

Units:	Master Counts : Follower Counts
Applicable Operating Mode:	Follower
When Enabled	Servo-Off -> Setting

Drive - Mode Configuration - Follower - Digital Filter Cut-off Frequency			
Drive - Mode Configuration - Follower - Digital Filter Cut-off Frequency- Line Drive Input			
Description	The controller has differential TTL/CMOS outputs		
Parameter	[Ft-3.08]-Digit0		
Range:	Select	Description	Value
	3.000	3.000 MHz	0x0
	1.750	1.750 MHz	0x1
	1.500	1.500 MHz	0x2
	1.000	1.000 MHz	0x3
	0.750	0.750 MHz	0x4
	0.625	0.625 MHz	0x5
	0.562	0.562 MHz	0x6
	0.525	0.525 MHz	0x7
Default:	1.000		
Applicable Operating Mode	All		
When Enabled	Servo-Off -> Setting		
Drive - Mode Configuration - Follower - Digital Filter Cut-off Frequency- Open Collector Input			
Description	The controller has single-ended transistor outputs		
Parameter	[Ft-3.08]-Digit1		
Range:	Select	Description	Value
	3.000	3.000 MHz	0x0
	1.750	1.750 MHz	0x1
	1.500	1.500 MHz	0x2
	1.000	1.000 MHz	0x3
	0.750	0.750 MHz	0x4
	0.625	0.625 MHz	0x5
	0.562	0.562 MHz	0x6
	0.525	0.525 MHz	0x7
Default:	0.525		
Applicable Operating Mode	All		
When Enabled	Servo-Off -> Setting		
Drive - Mode Configuration - Follower - Digital Filter Cut-off Frequency- High Frequency Line Drive Input			
Description	The controller has differential TTL/CMOS outputs		
Parameter	[Ft-3.08]-Digit2		
Range:	Select	Description	Value
	3.000	3.000 MHz	0x0
	1.750	1.750 MHz	0x1
	1.500	1.500 MHz	0x2

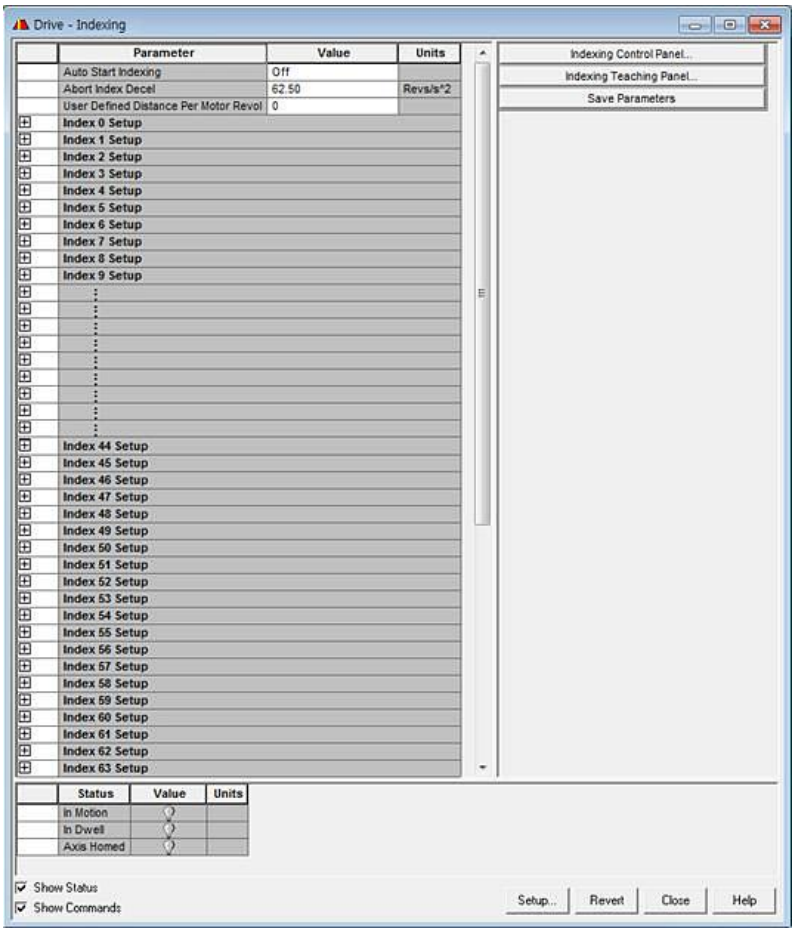
	1.000	1.000 MHz	0x3
	0.750	0.750 MHz	0x4
	0.625	0.625 MHz	0x5
	0.562	0.562 MHz	0x6
	0.525	0.525 MHz	0x7
Default:	3.000		
Applicable Operating Mode	All		
When Enabled	Servo-Off -> Setting		

Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Understanding the Indexing Window

The Properties window for Indexing looks like this:

Note: The Properties window for Indexing of CSD5 Drive and KNX3 Drive are not same. The below is an illustration of CSD5 Drive.



Use the Indexing window to:

- configure up to sixty-four indexes (0 ~63)for CSD5 Drive.[(0~6) for KNX3 Drive], and
- open the Indexing Control Panel where you can:

  -start and stop execution of the index command

  -start and stop homing

  -enable or disable a drive, and

  -monitor the execution of an index.

An index controls drive operation by executing preconfigured motion commands.

An index controls drive operation when Operating Mode is set to Indexing, in the CSD5 Drive window. The drive uses the index whose number (0 ~63) reflects the cumulative binary values of the Preset Select Lines 0, 1, 2, 3, 4 and 5, that are selected in the Digital Inputs window.

The digital input Preset Select Line binary values are as follows:

- Preset Select 0 = 1 if active, 0 if not.
- Preset Select 1 = 2 if active, 0 if not.
- Preset Select 2 = 4 if active, 0 if not.
- Preset Select 3 = 8 if active, 0 if not.
- Preset Select 4 = 16 if active, 0 if not.
- Preset Select 5 = 32 if active, 0 if not

If a Preset Select Line is not assigned to a digital input, the Preset Select Line is considered inactive.

The following parameters, statuses and commands apply to Indexing:

<table>
<tr><td colspan="4">Drive - Mode Configuration - Indexing</td></tr>
<tr><td colspan="4">Drive - Mode Configuration - Indexing - Auto Start Indexing</td></tr>
<tr><td>Description</td><td colspan="3">When this field is set to "on", the drive will begin executing the selected index whenever the drive enables.</td></tr>
<tr><td>Parameter</td><td colspan="3">[IN00.00]</td></tr>
<tr><td rowspan="3">Range:</td><td>Select</td><td>Description</td><td>Value</td></tr>
<tr><td>Off</td><td>Drive starts to move to the selected index with start indexing input after drive enable</td><td>0x0</td></tr>
<tr><td>On</td><td>Drive starts to move to the selected index without start indexing input after drive enable</td><td>0x1</td></tr>
<tr><td>Default:</td><td colspan="3">Off</td></tr>
<tr><td>Applicable Operating Mode</td><td colspan="3">Indexing</td></tr>
<tr><td>When Enabled</td><td colspan="3">Power Cycling</td></tr>
<tr><td colspan="4">Drive - Mode Configuration - Indexing - Abort Index Decel</td></tr>
</table>

Description	The deceleration used to stop motion when the Stop Index input terminates an index move.
Parameter	[IN00.01]
Range:	0.01~21474836.47 for rotary; 0.001~2147483.647 for linear.
Default:	62.50 for rotary,6.250for linear
Units:	*Rev/sec^2 for rotary, mm/sec^2 for linear
Applicable Operating Mode	Indexing
When Enabled	Always
Drive - Mode Configuration - Indexing - User Defined Distance Per Motor Revolution	
Description	This parameter is the user defined distance per motor 1 revolution in order to change the unit of indexing point distance
Parameter	[IN00.07]
Range:	0~99,999
Default:	0
Units:	User Defined
Applicable Operating Mode	Indexing
When Enabled	Power Cycling

Drive - Mode Configuration - Indexing-Index0~63 Setup			
Drive - Mode Configuration - Indexing - Index0~63 Setup-Mode			
Description	Note: The axis must be homed before the drive can execute any index. The shaded "Registration" is not available at Phase 2		
Parameter	[IN02.00~IN02.63]-Digit 0		
Range:	Select	Description	Value
	Absolute	Moves from its starting position to the specified Position, below.	0x0
	Incremental	Moves from its starting position the specified Distance, below.	0x1
Default:	Incremental		
Applicable Operating Mode	Indexing		
When Enabled	Always		
Drive - Mode Configuration - Indexing - Index0~63 Setup-Distance or Position			
Description	Position: For Absolute mode moves, the fixed position to which the motor will travel. Distance: For Incremental and Registration mode moves, the relative distance the motor will travel.		
Parameter	[IN04.00~IN04.63]		
Range:	-2,147,483,647~2,147,483,647		
Default:	0		
Units:	Counts		
Applicable Operating Mode	Indexing		
When Enabled	Always		
Drive - Mode Configuration - Indexing - Index0~63 Setup- Dwell			

Description	Milliseconds to remain at current position before executing
Parameter	[IN07.00~IN07.63]
Range:	0~65,535
Default:	0
Units:	ms
Applicable Operating Mode	Indexing
When Enabled	Always
Drive - Mode Configuration - Indexing - Index0~63 Setup- Velocity	
Description	Maximum velocity while in motion.
Parameter	[IN08.00~IN08.63]
Range:	0~6000 for rotary;0.000~6.000for liner
Default:	750 for rotary;0.750 for linear
Units:	RPM for rotary motors, mm/sec for linear motors
Applicable Operating Mode	Indexing
When Enabled	Always
Drive - Mode Configuration - Indexing - Index0~63 Setup- Acceleration	
Description	Maximum velocity while in motion.
Parameter	[IN10.00~IN10.63]
Range:	0.01~21474836.47 for rotary; 0.001~2147483.647 for linear.
Default:	62.50 for rotary,6.250for linear
Units:	*Rev/sec^2 for rotary, mm/sec^2 for linear
Applicable Operating Mode	Indexing
When Enabled	Always
Drive - Mode Configuration - Indexing - Index0~63 Setup- Deceleration	
Description	Maximum deceleration while in motion
Parameter	[IN11.00~IN11.63]
Range:	0.01~21474836.47 for rotary; 0.001~2147483.647 for linear.
Default:	62.50 for rotary,6.250for linear
Units:	*Rev/sec^2 for rotary, mm/sec^2 for linear
Applicable Operating Mode	Indexing
When Enabled	Always
Drive - Mode Configuration - Indexing - Index0~63 Setup- Next Index	
Description	The number (0~63) of the next indexed move to execute when Action When Complete is not set to “Stop”.
Parameter	[IN12.00~IN12.63]
Range:	0~63
Default:	0
Units:	-
Applicable Operating	Indexing

Mode			
When Enabled	Always		
Drive - Mode Configuration - Indexing - Index0~63 Setup-Action When Complete			
Description	The drive's action when the index has completed.		
Parameter	[IN02.00~IN02.63]-Digit 1		
Range:	Select	Description	Value
	Stop	Ends the execution of indexed move commands (default setting).	0x0
	Start next index	Commands execution of the Next Index move without additional input, but after the scheduled Dwell.	0x1
	Wait for Start	Commands execution of the Next Index move the next time the Start Index input becomes active.	0x2
Default:	Stop		
Applicable Operating Mode	Indexing		
When Enabled	Always		

The following statuses can be displayed from a Indexing window of an on-line drive:

Status	Description
In Motion	ON indicates the motor is moving in response to an indexed motion command. Note: The In Motion status has a value of 1 when ON, and 0 when OFF.
In Dwell	ON indicates the motor is holding position and waiting the commanded dwell time. Note: The In Dwell status has a value of 1 when ON, and 0 when OFF.
Axis Homed	ON indicates that the homing routine has completed. Note: The Axis Homed status has a value of 1 when ON, and 0 when OFF.

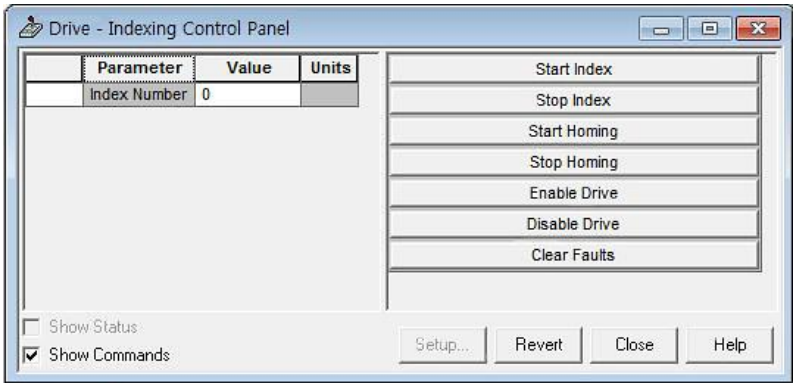
The following command can be executed from a Indexing window of an on-line drive:

Customize the Indexing window for your CSD5 Drive by selecting one or more of the following buttons:

- Toggle the **Show Status** selection to display or hide the Status pane.
- Toggle the **Show Commands** selection to display or hide the Commands pane
- Click on the **Setup** button to open the Monitor Setup window as shown on page 112, where you can customize the status display for this window.
- Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Indexing Control Panel

The Properties window for the Indexing Control Panel looks like this:



The Indexing Control Panel allows the user to select one of sixty-four possible indexes, and send direct commands to the selected drive.

Use the Indexing Control Panel window to:

- Start or stop the execution of an indexed motion command.
- Start or stop homing.
- Enable or disable a drive.
- Reset all drive faults.

The commands you execute override any motion commands originating from the drive's normal operation mode, set in the CSD5 Drive window.

ATTEN- 	The Indexing Control Panel commands override the normal operation mode. The motor moves in response to Indexing Control Panel commands!

The Indexing Control Panel has the following parameter, and direct commands:

Parameters	Description
Index Number	The number (0 - 63) of the indexed motion command, configured in the Indexing window, which starts when you select the Start Index.

The following commands can be executed from the Indexing window of an on-line drive:

Commands	Description
Start Index	Begins execution of the indexed motion command (0 - 63) specified in the Index Number parameter.

Stop Index	Stops execution of the indexed motion command (0 - 63) specified in the Index Number parameter.
Start Homing	Begins execution of the homing sequence as defined in the Homing window.
Stop Homing	Stops execution of the homing sequence.
Enable Drive	Enables the power stage of a drive.
Disable Drive	Disables the power stage of a drive.
Clear Faults	Clears all drive faults

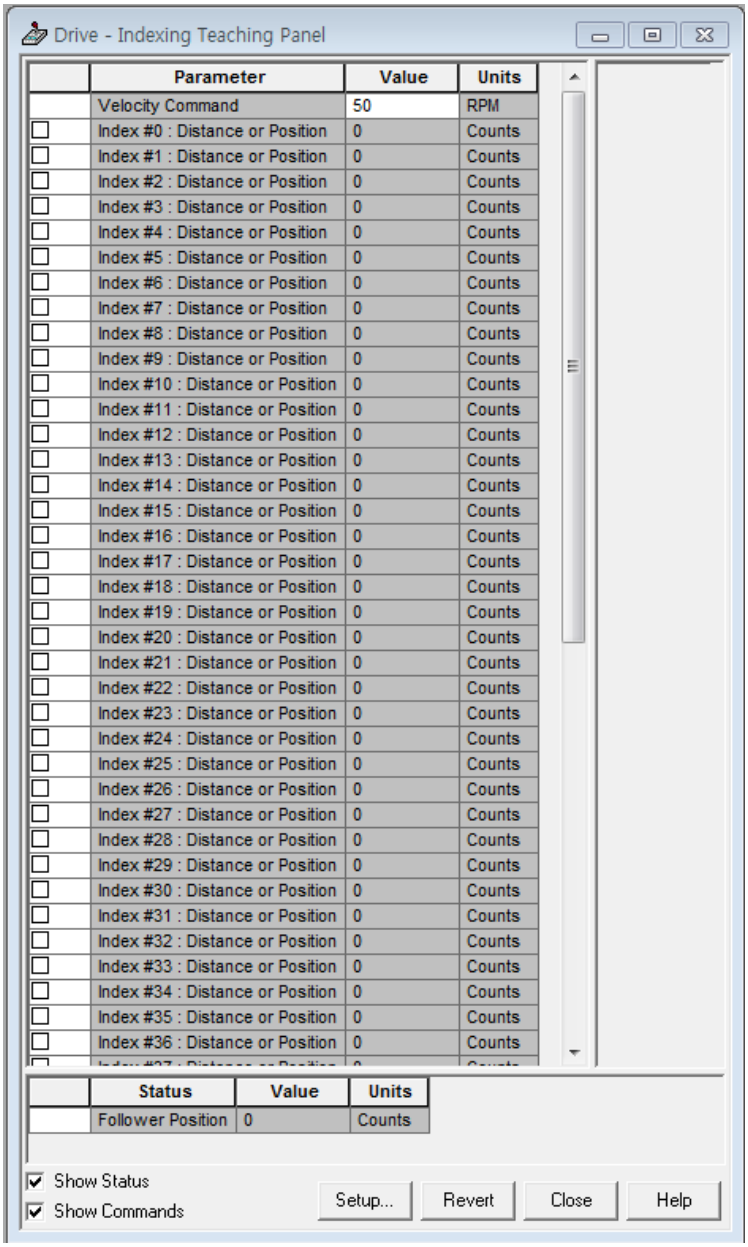
Note: Closing the window returns the drive to its normal operating mode, but software disabled. Select the drive and execute an Enable command and instructed in the Windows' message to make the drive operational.

Customize the Indexing Control Panel window for your CSD5 Drive by selecting one or more of the following buttons:

- Toggle the **Show Status** selection to display or hide the Status pane.
- Toggle the **Show Commands** selection to display or hide the Commands pane
- Click on the **Setup** button to open the Monitor Setup window as shown on page 112, where you can customize the status display for this window.
- Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Indexing Teaching Panel

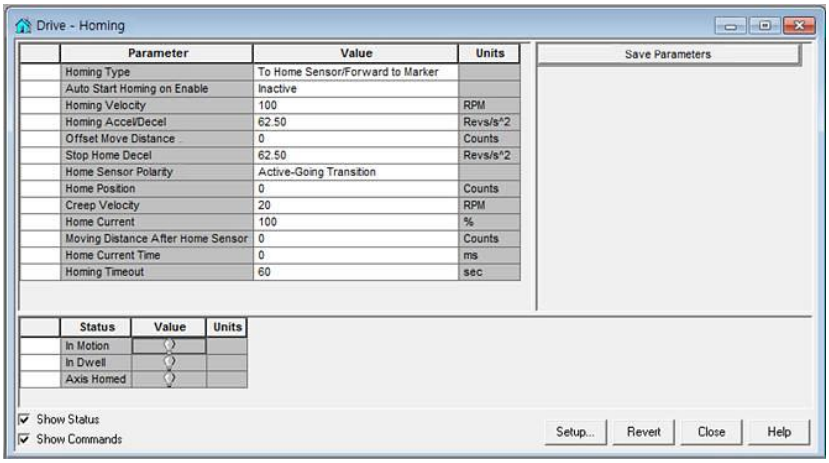
The Properties window for the Indexing Teaching Panel looks like this:



- Indexing Teaching Panel is added from RSWare Version 1.2.0.
- After the motor moved by the Jog operation, “Teaching save" button is pressed, the current value of the Follower position is stored as the Distance or Position parameters of selected index.

Understanding the Homing Window

The Properties window for Homing looks like this:



Use the Homing window to configure the type of homing operation the drive performs.

Note: Homing operations are performed by issuing the Start Homing command from the Indexing Control Panel.

Homing has no associated statuses. Except for Copy and Paste, it just has a Save Parameters command.

Note: A homing operation is performed by issuing the Start Homing command in the Indexing Control Panel.

The following parameters apply to Homing:

Drive - Mode Configuration - Homing			
Drive - Mode Configuration - Indexing - Homing - Homing Type			
Description	Select the type of homing operation the drive will perform		
Parameter	[IN01.00]		
Range:	Select	Description	Value
	Home to Present Position	The position when a Start Homing signal is inputted becomes the new home. If the Auto Start Homing function is enabled, the position when the drive is enabled becomes the new home	0x0
	To Home sensor/Back to Marker	After the active-going edge of the sensor is detected, the drive immediately reverses motor direction and looks for the inactive-going edge of the sensor. After the inactive-going edge of the sensor is detected, the drive looks for the marker. After the marker is detected, the drive moves the motor the Offset Move Distance from the marker, reversing if necessary. The final position becomes the new Home position. The Homing Velocity is used for the initial sensor search. After the motor decelerates to a stop when it finds the active-going sensor edge, the Creep Velocity is used for all the remaining motion.	0x1
	To Limit/Back to Marker	This homing procedure is the same as the 'To Home sensor / Back to Marker', only except that the physical overtravel is used instead of home sensor input. The physical overtravel fault is disabled while homing	0x2

	To Home sensor/Fwd to Marker	After the active-going edge of the sensor is detected, the drive looks for the marker. After the marker is detected, the drive moves the motor the Offset Move Distance from the marker, reversing if necessary. The final position becomes the new Home position.	0x3
	To Limit/Fwd to Marker	The homing procedure is the same as the 'To Home sensor / Fwd to Marker ', only except that the physical overtravel is used instead of home sensor input. The physical overtravel fault is disabled while homing	0x4
	Home to Current Value	The drive moves the motor at the Homing Velocity until the feedback current reaches the Home Current Value. After the Home Current Value is hit, the drive immediately stops the motor motion and moves the Offset Move Distance, reversing if necessary. The final position becomes the new Home position	0x5
	Home to Current Value/Back to Marker	After the Home Current Value is reached, the drive immediately reverses motor direction and looks for the marker. After the marker is detected, the drive moves the motor the Offset Move Distance from the marker, reversing if necessary. The final position becomes the new Home position. The Homing Velocity is used for the initial motion until the current value is reached. The Creep Velocity is used for all the remaining motion.	0x6
	To Home sensor/Move/Fwd to Marker	Sometimes, the distance is very short between home sensor and marker, so it may miss to detect the first marker. To prevent this, this method has one more parameter to define a minimum distance to detect Marker. The minimum distance is defined as a time in the 'moving distance after home sensor'. After it detects the home sensor input, the velocity is decelerated to the creep velocity and it is maintained until the marker is detected. After the marker is detected, the motor move back to the position	0x7
	Home to Marker	After the marker is detected, the drive moves the motor the Offset Move Distance from the marker, reversing if necessary. The final position becomes the new Home position.	0x8
Default:	To Home Sensor/Back to Marker		
Applicable Operating Mode	Indexing		
When Enabled	Disable drive		

Drive - Mode Configuration - Homing - Auto Start Homing on Enable

Description	Causes the drive to begin the homing procedure automatically when the drive is enabled.		
Parameter	[IN01.01]		
Range:	Select	Description	Value
	Active:	Automatically starts homing every time the drive is enabled.	0x0
	Active After Reset Only	Automatically starts homing when a drive is enabled, if the drive has not already been homed	0x1
	Inactive	Starts homing with start homing input	0x2
Default:	Inactive		
Applicable Operating Mode	Indexing		
When Enabled	Power Cycling		

Drive - Mode Configuration - Homing - Homing Velocity			
Description	The commanded velocity used during homing. The sign of this value (+/-) indicates the direction of motion during homing.		
Parameter	[IN01.02]		
Range:	-6,000~6,000		
Default:	100		
Units	RPM for rotary motors, mm/sec for linear motors		
Applicable Operating Mode	Indexing		
When Enabled	Disable drive		
Drive - Mode Configuration - Homing - Homing Accel/Decel			
Description	The rate of acceleration and deceleration used during homing		
Parameter	[IN01.04]		
Range:	62.50		
Default:	100		
Units	Rev/sec^2 for rotary, mm/sec^2 for linear		
Applicable Operating Mode	Indexing		
When Enabled	Disable drive		
Drive - Mode Configuration - Homing - Offset Move Distance			
Description	The distance the motor position will be from the marker edge (or sensor edge for Sensor only Homing Type) after the homing sequence is complete.		
Parameter	[IN01.05]		
Range:	-2,147,483,647~2,147,483,647		
Default:	0		
Units	Counts		
Applicable Operating Mode	Indexing		
When Enabled	Disable drive		
Drive - Mode Configuration - Homing - Stop Home Decel			
Description	The rate of drive deceleration used when homing is stopped.		
Parameter	[IN01.12]		
Range:	1~2,147,483,647		
Default:	6250		
Units	Rev/sec^2 for rotary, mm/sec^2 for linear		
Applicable Operating Mode	Indexing		
When Enabled	Disable drive		
Drive - Mode Configuration - Homing - Home Sensor Polarity			
Description	Specifies the digital input state which indicates to the drive that the Home Sensor input is active		
Parameter	[IN01.06]		
Range:	Select	Description	Value

	Active- Going Transition	Active- Going Transition	0x0
	Inactive- Going Transition	Inactive- Going Transition	0x1
Default:	Inactive		
Applicable Operating Mode	Indexing		
When Enabled	Power Cycling		
Drive - Mode Configuration - Homing - Home Position			
Description	The home position when a homing procedure is completed.		
Parameter	[IN01.07]		
Range:	-2,147,483,647~2,147,483,647		
Default:	0		
Units	Counts		
Applicable Operating Mode	Indexing		
When Enabled	Disable drive		
Drive - Mode Configuration - Homing - Creep Velocity			
Description	For the To Sensor, then Back to Marker Homing Type, the velocity used for all remaining homing motion after the motor decelerates to a stop when it finds the sensor edge.		
Parameter	[IN01.03]		
Range:	0~6,000		
Default:	20		
Units	RPM for rotary motors, mm/sec for linear motors		
Applicable Operating Mode	Indexing		
When Enabled	Disable drive		
Drive - Mode Configuration - Homing - Home Current			
Description	Specifies the torque feedback at which the drive stops moving the motor at the Homing Velocity. Unit : Percentages of a motor rating torque		
Parameter	[IN01.09]		
Range:	1~250		
Default:	100		
Units	%		
Applicable Operating Mode	Indexing		
When Enabled	Disable drive		
Drive - Mode Configuration - Homing - Moving Distance After Home Sensor			
Description	This value is distance that the drive ignores the marker inputs after the home sensor is detected.		
Parameter	[IN01.08]		
Range:	0~2,147,483,647		
Default:	0		
Units	Counts		
Applicable Operating Mode	Indexing		

When Enabled	Disable drive
Drive - Mode Configuration - Homing - Home Current Time	
Description	The time to when the torque feedback is more than the home current to when the drive detects stopper.
Parameter	[IN01.10]
Range:	0~1,000
Default:	0
Units	ms
Applicable Operating Mode	Indexing
When Enabled	Disable drive
Drive - Mode Configuration - Homing - Homing Timeout	
Description	Drive fault occurs when time for homing is over the homing time limit.
Parameter	[IN01.11]
Range:	0~65,535
Default:	60
Units	sec
Applicable Operating Mode	Indexing
When Enabled	Disable drive

The following statuses can be displayed from a Homing window of an on-line drive:

Status	Description
In Motion	ON indicates the motor is moving in response to an indexed motion command. Note: The In Motion status has a value of 1 when ON, and 0 when OFF.
In Dwell	ON indicates the motor is holding position and waiting the commanded dwell time. Note: The In Dwell status has a value of 1 when ON, and 0 when OFF.
Axis Homed	ON indicates that the homing routine has completed. Note: The Axis Homed status has a value of 1 when ON, and 0 when OFF.

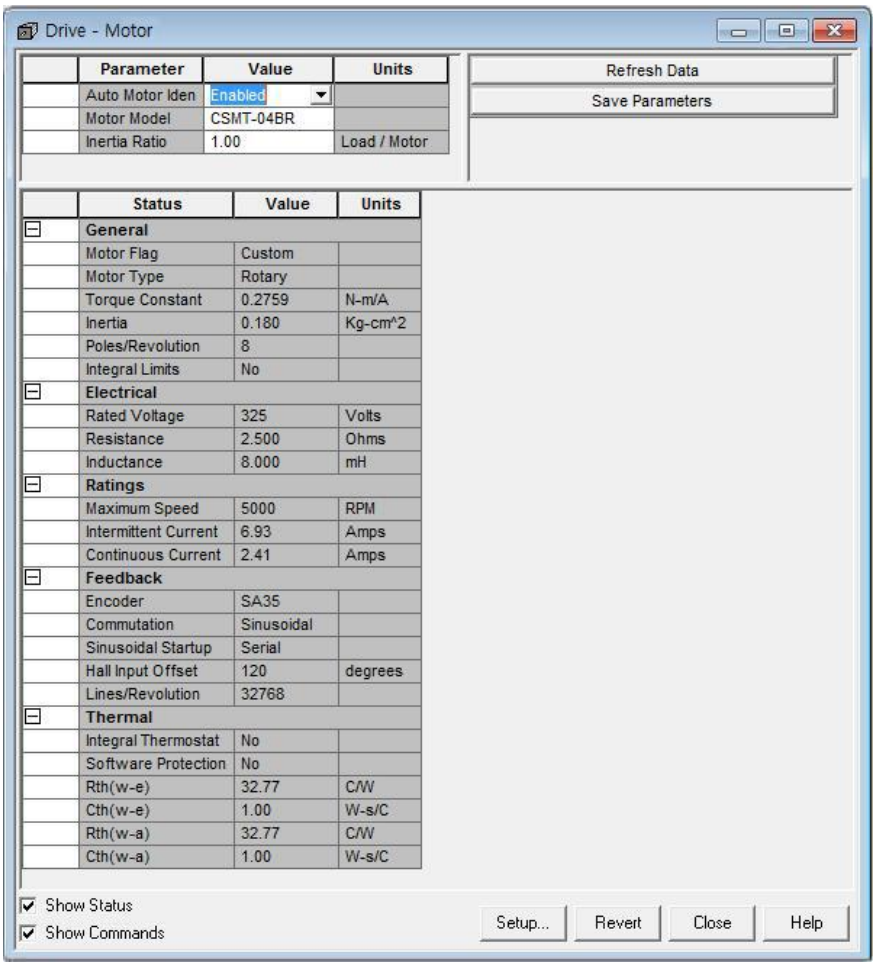
Customize the Homing window for your CSD5 Drive by selecting one or more of the following buttons:

- Toggle the **Show Status** selection to display or hide the Status pane.
- Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Understanding the Motor Window

The Properties window for Motors looks like this:

Note: The Properties window for Motors of CSD5 Drive and KNX3 Drive are not same. The below is an illustration of CSD5 Drive.

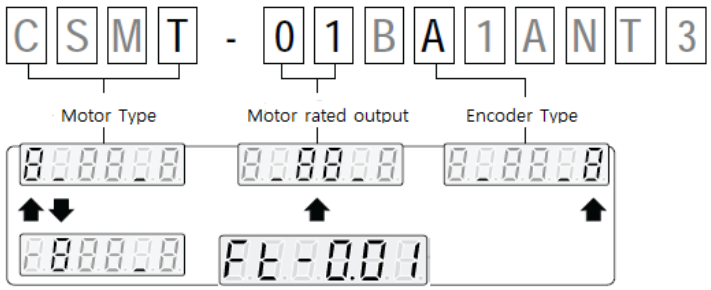


Use the Motor window to:

- Select a motor for the associated on-line or off-line CSD5 drive. Once you select a motor, the status values associated with the selected motor appears in the Status pane of this window.
- Monitor the statuses that relate to the selected motor.

The following parameters, statuses and commands apply to motors:

Drive - Motor	
Drive – Motor-Auto Motor Iden	
Description	Select the type of homing operation the drive will perform
Parameter	[Ft-0.06]- Digit 0

Range:	Select	Description	Value
	Disabled	Causes the drive to read motor parameters from a Motor Model selected, below.	0x0
	Enabled	Causes the drive to read motor parameters from an intelligent encoder	0x1
Default:	Disabled		
Applicable Operating Mode	All		
When Enabled	Immediately		
Drive – Motor- Motor Model			
Description	(Only if Auto Motor Iden is disabled.) The model name of the selected motor. Only listed motor models are valid. Note: RSWare ships with a Motor Configuration utility that lets you create custom motor configurations. Use that utility to add customized motor selections to the Motor Model list, by clicking on the Start button, then selecting Programs, OEMax Software, RSWare and Motor Configuration from the pop-up menus.		
Parameter	[Ft-0.01]		
Setting Value:	•Set three items of the motor: motor type, motor rated output, and encoder type. •check the model name on the motor nameplate. •Press Up/Down arrow keys, alphabetic and numeric characters representing each mode is displayed. •The following figure is an example of the nameplate on the motor. Refer to the following figure to set the predefined place for each items. 		
Default:			
Applicable Operating Mode	All		
When Enabled	Servo-Off -> Setting -> After power cycle		
Drive – Motor- Inertia Ratio			
Description	Load Inertia / Motor Inertia		
Parameter	[Ft-0.04]		
Range:	0~6000		
Default:	1.00		
Units:	(Load inertia/Motor inertia)		
Applicable Operating Mode	All		
When Enabled	Immediately		

The following statuses are displayed by default for the Motor branch of an on-line drive.

Status	Description
General	
Motor Flag	Either: **Automatic:** indicates the drive automatically determines the motor settings by communicating with the encoder. **Standard:** indicates a motor whose status settings come preconfigured by RSWare. **Custom:** indicates a user-configured motor which was added to the Motor Model list, above, using the utility that ships with RSWare.
Motor Type	Indicate the type of motor: **Linear** **Rotary**
Torque Constant	(Only for rotary motors) The sinusoidal force constant, in Newton meters/Ampere (N-m/A).
Inertia	Rotor inertia, in Kilogram-centimeter squared (kg-cm2).
Poles/Revolution	The number of motor poles per revolution.
Integral Limits	Indicates whether the motor provides built in feedback for travel limits: **Yes** **No**
Electrical	
Rated Voltage	Voltage rating of the motor in Volts.
Resistance	The phase-to-phase resistance of the motor stator, in Ohms.
Inductance	The phase-to-phase inductance of the motor stator, in milliHenries (mH).
Ratings	
Maximum Speed	Maximum motor output shaft speed, in revolutions/minute (RPM) for rotary motors, meters/second (Meters/sec) for linear motors.
Intermittent Current	Maximum intermittent current of the motor in peak Amperes
Continuous Current	Continuous current rating of the motor in peak Amperes.
Feedback	
Encoder	The encoder type: **Incremental** **Sine/Cosine**
Commutation	The type of commutation: **Brush** **Trapezoidal** **Sinusoidal**
Hall Input Offset	Offset Hall Input offset, from standard RS Automation orientation, in electrical degrees.

The following commands can be executed for a Motor window of an on-line CSD5 drive:

Commands	Description
Refresh Data	Reads the motor definition information from the motor database and reapplies it to the drive. Note: This command is useful when a motor definition in the motor database has been changed.
Save parameters	Save parameters

Customize the Motor window for your CSD5 Drive branch by selecting one or more of the following buttons:

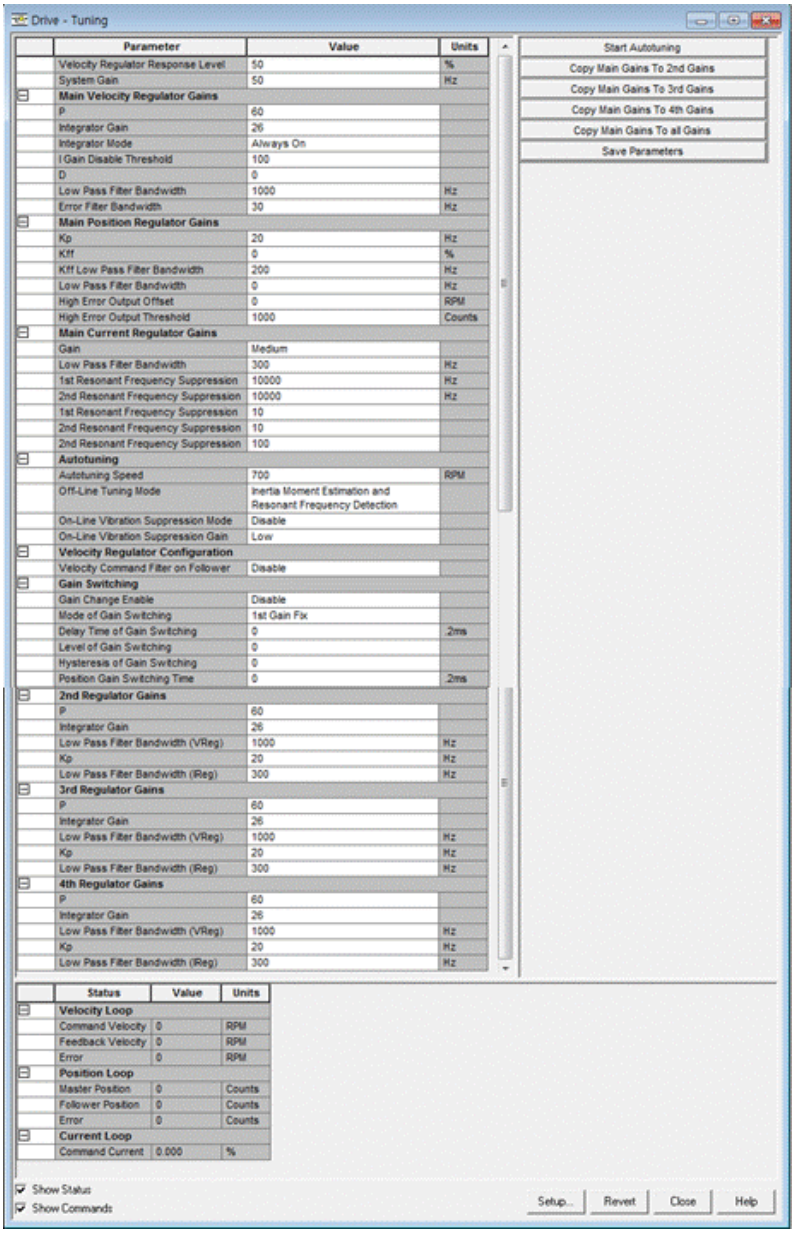
- Toggle the **Show Status** selection to display or hide the Status pane.

- Toggle the **Show Commands** selection to display or hide the Commands pane.
- Click on the **Setup** button to open the Monitor Setup window as shown on page 112, where you can customize the status display for this window.
- Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Understanding the Tuning Window

The Properties window for the Tuning branch looks like this:

Note: The Properties window for Tuning of CSD5 Drive and KNX3 Drive are not same. The below is an illustration of CSD5 Drive.



Use the Tuning window to:

- Configure Velocity Regulator Response Level and System Gain that are used in tuning.
- Monitor Velocity, Position and Current loop statuses.
- Open windows where you can execute commands for start autotuning, copy main gains to 2nd, 3rd, 4th, all gains.

RSWare uses a nested digital servo control loop, consisting of an outer position regulator (using proportional, integral, derivative and feedforward gains), around an inner velocity regulator (using its own set of proportional, integral and derivative gains).

Together, these regulators provide software control over the servo dynamics, and stabilize the servo system.

The following parameters, statuses and commands apply to this window:

Drive - Tuning	
Drive - Tuning - Velocity Regulator Response level	
Description	Set system gain in proportion to speed response level automatically by referring the estimated inertia ratio after auto tuning.
Parameter	[Ft-1.00]
Range:	1~150
Default:	50
Units:	%
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Tuning - System Gain	
Description	• A higher value results in higher position/speed/torque related gain values and higher responsiveness. (However, excessive values can result in noise and vibrations) • Conversely, lower values result in smaller gain and lower responsiveness; however, the whole system's stability is increased. • Refers to the bandwidth of the entire speed control loop. • When this value is changed, the gain values [Ft-1.02], [Ft-1.03], [Ft-1.06],[Ft-1.07], [Ft-1.08] are set automatically according to the control mode while referring to the inertia ratio parameter [Ft-0.04]. •The lower limit is 10 [Hz].
Parameter	[Ft-1.01]
Range:	10~500
Default:	50
Units:	Hz
Applicable Operating Mode:	All
When Enabled	Immediately

Drive - Tuning - Main Velocity Regulator Gains	
Drive - Tuning - Main Velocity Regulator Gains-P	
Description	Proportional gain for the velocity loop. The P gain generates a control signal proportional to the velocity error. Note: Increasing the P gain improves response time and increases the stiffness of the system. Too high a P gain value causes instability; too low a P gain value results in loose or sloppy system dynamics.
Parameter	[Ft-1.02]
Range:	0~10000
Default:	60
Units:	-
Applicable Operating Mode:	Follower, Analog Speed, Preset
When Enabled	Immediately
Drive - Tuning - Main Velocity Regulator Gains-Integrator Gain	
Description	Integral gain for the velocity loop. The I gain generates a control signal proportional to the integral of the velocity error. Note: I gain improves the steady-state velocity performance of the system. Increasing the integral gain generally increases the ultimate positioning accuracy of the system. However excessive integral gain results in system instability.
Parameter	[Ft-1.03]
Range:	0~60000

Default:	26		
Units:	-		
Applicable Operating Mode:	Follower, Analog Speed, Preset		
When Enabled	Immediately		
Drive - Tuning - Main Velocity Regulator Gains-Integrator Mode			
Description	During transient response, Speed Response Overshoot can be suppressed by speed controller change from Proportion Integration (PI) Controller into Proportion (P) Controller. It reduces Position completion time during Position Control.		
Parameter	[Ft-1.17]		
Range:	Select	Description	Value
	Always On	Do not use P/PI Mode Conversion.	0x0
	High Current Disable	When Current Command exceeds Current Value in [Ft-1.18], Speed Controller is changed from PI Controller to P Controller.	0x1
	Velocity Command Disable	When Speed Command exceeds Speed Value in [Ft-1.18], Speed Controller is changed from PI Controller to P Controller.	0x2
	Position Error Disable	When Position error exceeds Position error Value in [Ft-1.18], Speed Controller is changed from PI Controller to P Controller.	0x3
	Automatic Disable	Automatically velocity controller is changed from PI Controller to P Controller.	0x4
Default:	Always On		
Applicable Operating Mode:	ALL		
When Enabled	Servo-Off -> Setting		
Drive - Tuning - Main Velocity Regulator Gains-I Gain Disable Threshold			
Description	If the speed torque command or the position tolerance exceeds the value set in this parameter, the speed controller changes from PI type to P type		
Parameter	[Ft-1.18]		
Range:	0~3000		
Default:	100		
Units:	If [Ft-1.17] = 1, units are % of rated continuous current If [Ft-1.17] = 2, units are RPM for rotary motors units are mm/sec for linear motors If [Ft-1.17] = 3, units are Counts		
Applicable Operating Mode:	Follower, Analog Velocity, Preset		
When Enabled	Immediately		
Drive - Tuning - Main Velocity Regulator Gains-D			
Description	Derivative gain value for the velocity loop. The D gain generates a control signal proportional to measured acceleration. Note: Positive D gain reduces velocity overshoot, and negative D gain should be used only in systems that exhibit mechanical resonance.		
Parameter	[Ft-1.04]		
Range:	0~1000		
Default:	0		
Units:	-		
Applicable Operating Mode:	Follower, Analog Velocity, Preset		

When Enabled	Immediately
Drive - Tuning - Main Velocity Regulator Gains-Low Pass Filter Bandwidth	
Description	• The low pass of velocity command and setting the cutoff frequency to suppress high frequency components. • System gain value will change its value.
Parameter	[Ft-1.08]
Range:	0~10000
Default:	1000
Units:	Hz
Applicable Operating Mode:	Follower, Analog Speed, Preset
When Enabled	Immediately
Drive - Tuning - Main Velocity Regulator Gains-Error Filter Bandwidth	
Description	High frequency components of the velocity error are filtered.
Parameter	[Ft-1. 05]
Range:	0~2500
Default:	30
Units:	Hz
Applicable Operating Mode:	Follower, Analog Velocity, Preset
When Enabled	Immediately

Drive - Tuning - Main Position Regulator Gains	
Drive - Tuning - Main Position Regulator Gains-Kp	
Description	Proportional gain for the position loop. The Kp gain generates a control signal proportional to the position error. Note: Increasing the Kp gain improves response time and increases the stiffness of the system. Too high a Kp gain value causes instability; too low a Kp gain value results in loose or sloppy system dynamics.
Parameter	[Ft-1.06]
Range:	0~700
Default:	20
Units:	Hz
Applicable Operating Mode:	Follower
When Enabled	Immediately
Drive - Tuning - Main Position Regulator Gains-Kff	
Description	Feedforward gain for the position loop.The Kff gain generates a feed forward signal proportional to the commanded speed. Note: Kff gain reduces position following error. However high values can cause position overshoot.
Parameter	[Ft-1.15]
Range:	0~100
Default:	0
Units:	%
Applicable Operating Mode:	Follower
When Enabled	Immediately
Drive - Tuning - Main Position Regulator Gains-Kff Low Pass Filter Bandwidth	
Description	• Valid if position FF gain [Ft-1.15] is not '0'. • If a value other than '0' set for [Ft-1.15] results in overshoot or vibration, set this value to '0'.

Parameter	[Ft-1.16]
Range:	0~2500
Default:	200
Units:	Hz
Applicable Operating Mode:	Follower
When Enabled	Immediately
Drive - Tuning - Main Position Regulator Gains-Low Pass Filter Bandwidth	
Description	The connected drive's low pass filter's bandwidth. This value indicates the cutoff frequency of the low pass filter. Note: This filter reduces noise generated by encoder resolution or mechanical resonance in the system.
Parameter	[Ft-1.09]
Range:	0~10000
Default:	0
Units:	Hz
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Tuning - Main Position Regulator Gains-High Error Output Offset	
Description	When the position error is greater than the value of High Error Output Threshold, this constant velocity Bias will be input into the velocity controller.
Parameter	[Ft-1.19]
Range:	0~450
Default:	0
Units:	Rotary: RPM, Linear: mm/sec
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Tuning - Main Position Regulator Gains-High Error Output Threshold	
Description	The value of velocity bias is error standard value inputted into velocity controller.
Parameter	[Ft-1.20]
Range:	0~50000
Default:	1000
Units:	Counts
Applicable Operating Mode:	All
When Enabled	Immediately

Drive - Tuning - Main Current Regulator Gains			
Drive - Tuning - Main Current Regulator Gains - Gain			
Description	The bandwith for current control.		
Parameter	[Ft-1.21]		
Range:	Select	Description	Value
	High	High bandwidth	0x0
	Medium	Medium bandwidth (0.6667 * high)	0x1
	Low	Low bandwidth (0.3334 * high)	0x2
Default:	Medium		
Units:			

Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Tuning - Main Current Regulator Gains - Low Pass Filter Bandwidth	
Description	To suppress high frequency compents of the current command. It will be changed by the system gain value.
Parameter	[Ft-1.07]
Range:	0~10000
Default:	300
Units:	Hz
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Tuning - Main Current Regulator Gains - 1st Resonant Frequency Suppression Filter	
Description	Suppresses Vibration by cutting off Current Command in assigned frequency band
Parameter	[Ft-1.10]
Range:	0~10000
Default:	10000
Units:	Hz
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Tuning - Main Current Regulator Gains - 2nd Resonant Frequency Suppression Filter	
Description	Suppresses Vibration by cutting off Current Command in assigned frequency band
Parameter	[Ft-1.12]
Range:	0~10000
Default:	10000
Units:	Hz
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Tuning - Main Current Regulator Gains - 1st Resonant Frequency Suppression Filter Width	
Description	Set up the notch width of the 1st resonance suppressing filter in 20 steps. Higher the setup, larger the notch width you can obtain.
Parameter	[Ft-1.11]
Range:	0~20
Default:	10
Units:	-
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Tuning - Main Current Regulator Gains - 2nd Resonant Frequency Suppression Filter Width	
Description	Set up the notch width of 2nd resonance suppressing filter in 20 steps. Higher the setup, larger the notch width you can obtain.
Parameter	[Ft-1.13]
Range:	0~20

Default:	10
Units:	-
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Tuning - Main Current Regulator Gains - 2nd Resonant Frequency Suppression Filter Depth	
Description	Set up the 2nd notch depth of the resonance suppressing filter. Higher the setup, shallower the notch depth and smaller the phase delay you can obtain.
Parameter	[Ft-1.14]
Range:	0~100
Default:	100
Units:	-
Applicable Operating Mode:	All
When Enabled	Immediately

Drive - Tuning - Autotuning			
Drive - Tuning – Autotuning - Autotuning Speed			
Description	The larger the setting value, the higher speed.		
Parameter	[Ft-0.03]-Digit2		
Range:	200~900		
Default:	700		
Units:	RPM		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		
Drive - Tuning – Autotuning - Off-Line Tuning Mode			
Description	Select Off-Line autotuning mode		
Parameter	[Ft-0.03]-Digit0		
Range:	Select	Description	Value
	Inertia Moment Estimation	Inertia Moment Estimation	0x0
	Inertia Moment Estimation and Resonant Frequency Detection	Inertia Moment Estimation and Resonant Frequency Detection	0x1
	Resonance frequency Detection	Resonance frequency Detection	0x2
Default:	Inertia Moment Estimation and Resonant Frequency Detection		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		
Drive - Tuning – Autotuning - On-Line Vibration Suppression Mode			
Description	Select On-Line vibration suppression mode		
Parameter	[Ft-1.22]-Digit0		
Range:	Select	Description	Value
	Disable	Disable	0x0
	Normal and High Velocity Mode	Normal and High Velocity Mode	0x1
	Slow Velocity without initial value	Slow Velocity Mode without initial value	0x2

Default:	Disable		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		
Drive - Tuning – Autotuning - On-Line Vibration Suppression Gain			
Description	Select On-Line vibration suppression gain		
Parameter	[Ft-1.22]		
Range:	Select	Description	Value
	Low	Low	0x0
	High	High	0x1
Default:	Low		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		

Drive - Tuning – Velocity Regulator Configuration			
Drive - Tuning – Velocity Regulator Configuration- Velocity Command Filter on Follower			
Description	Select to make velocity command low pass filter take effect in follower mode		
Parameter	[Ft-1.23]-Digit0		
Range:	Select	Description	Value
	Disable	Disable	0x0
	Enable	Enable	0x1
Default:	Disable		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		

Drive - Tuning – Gain Switching			
Drive - Tuning – Gain Switching - Gain Change Enable			
Description	When gain value is switched from Second gain to first gain, you can set delay time.		
Parameter	[Ft-0.05]-Digit2		
Range:	Select	Description	Value
	Disable	Disable	0x0
	Enable	Enable	0x1
Default:	Disable		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting -> After power cycle		
Drive - Tuning – Gain Switching - Mode of Gain Switching			
Description	Select the gain switching mode		
Parameter	[Ft-0.06]-Digit2		
Range:	Select	Description	Value
	1st Gain Fix	Fixed to the 1st gain	0x0
	2nd Gain Fix	Fixed to 2nd gain	0x1
	Digital Input (G-SEL)	2nd gain selection when the gain switching input is turned on.	0x2
	Torque Command	2nd gain selection when the toque command is larger than the setups (level of gain control switching and hysteresis of control switching)	0x3

	Velocity Command	2nd gain selection when the command speed is larger than the setups (level of gain control switching and hysteresis of control switching)	0x4
	Position Error	2nd gain selection when the positional deviation is larger than the setups (level of gain control switching and hysteresis of control switching)	0x5
	Position Command	2nd gain selection when more then one command pulse exist between 200usec.	0x6
	In-Position	2nd gain selection when the positional deviation counter value exceeds the setup of Positioning completer range	0x7
	Velocity	2nd gain selection when the motor actual speed exceeds the setup (level of gain control switching and hysteresis of control switching). Switches to the 2nd gain while the position command exists.	0x8
	Position command and Speed	Switches to the 1st gain when no-position command status lasts for the setup of delay time of gain switching [x 200usec] and the speed falls slower than the setups of gain control switching level and hysteresis of control switching	0x9
Default:	1st Gain Fix		
Applicable Operating Mode:	All		
When Enabled	Immediately		
Drive - Tuning – Gain Switching - Delay Time of Gain Switching			
Description	When gain value is switched from Second gain to first gain, you can set delay time.		
Parameter	[Ft-1.24]		
Range:	0~10000		
Default:	0		
Units:	x 200usec		
Applicable Operating Mode:	Follower, Analog Velocity, Preset		
When Enabled	Immediately		
Drive - Tuning – Gain Switching - Level of Gain Switching			
Description	Set standard value for gain switching. The setting value is for Gain Switching Mode ([Ft-0.06]-Digit2).		
Parameter	[Ft-1.25]		
Range:	0~10000		
Default:	0		
Units:	-		
Applicable Operating Mode:	Follower, Analog Velocity, Preset		
When Enabled	Immediately		
Drive - Tuning – Gain Switching - Hysteresis of Gain Switching			
Description	Operates Hysteresis based on operation level when gain switching. The setting value is for Gain Switching Mode ([Ft-0.06]-Digit1).		
Parameter	[Ft-1.26]		
Range:	0~10000		
Default:	0		
Units:	-		
Applicable Operating Mode:	Follower, Analog Velocity, Preset		
When Enabled	Immediately		
Drive - Tuning – Gain Switching - Position Gain Switching Time			

Description	Adjust as Position Gain Switching Time step by step when switching gain value from first gain to second gain.
Parameter	[Ft-1.27]
Range:	0~10000
Default:	0
Units:	x 200μsec
Applicable Operating Mode:	Follower, Analog Velocity, Preset
When Enabled	Immediately

Drive - Tuning – 2nd Regulator Gains	
Drive - Tuning – 2nd Regulator Gains - P	
Description	Parameter which determines the responsiveness of speed control
Parameter	[Ft-1.28]
Range:	0-10000
Default:	60
Units:	-
Applicable Operating Mode:	Follower, Analog Velocity, Preset
When Enabled	Immediately
Drive - Tuning – 2nd Regulator Gains - Integrator Gain	
Description	• Removes steady state speed tolerance. • Overshoot in speed response can occur if set value is too large.
Parameter	[Ft-1.29]
Range:	0~60000
Default:	26
Units:	-
Applicable Operating Mode:	Follower, Analog Velocity, Preset
When Enabled	Immediately
Drive - Tuning – 2nd Regulator Gains - Low Pass Filter Bandwidth (VReg)	
Description	Sets low pass cutoff frequency of speed command to suppress high frequency components.
Parameter	[Ft-1.32]
Range:	0~10000
Default:	1000
Units:	Hz
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Tuning – 2nd Regulator Gains - Kp	
Description	• Parameter which determines the responsiveness of position control • Change set value according to rigidity of load
Parameter	[Ft-1.30]
Range:	0~700
Default:	20
Units:	Hz
Applicable Operating Mode:	Position
When Enabled	Immediately

Drive - Tuning – 2nd Regulator Gains - Low Pass Filter Bandwidth (IReg)	
Description	Suppresses high frequency components of torque command
Parameter	[Ft-1.31]
Range:	0~10000
Default:	300
Units:	Hz
Applicable Operating Mode:	All
When Enabled	Immediately

Drive - Tuning – 3rd Regulator Gains	
Drive - Tuning – 3rd Regulator Gains - P	
Description	Parameter which determines the responsiveness of speed control
Parameter	[Ft-1.33]
Range:	0-10000
Default:	60
Units:	-
Applicable Operating Mode:	Follower, Analog Velocity, Preset
When Enabled	Immediately
Drive - Tuning – 3rd Regulator Gains - Integrator Gain	
Description	• Removes steady state speed tolerance. • Overshoot in speed response can occur if set value is too large.
Parameter	[Ft-1.34]
Range:	0~60000
Default:	26
Units:	-
Applicable Operating Mode:	Follower, Analog Velocity, Preset
When Enabled	Immediately
Drive - Tuning – 3rd Regulator Gains - Low Pass Filter Bandwidth (VReg)	
Description	Sets low pass cutoff frequency of speed command to suppress high frequency components.
Parameter	[Ft-1.37]
Range:	0~10000
Default:	1000
Units:	Hz
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Tuning – 3rd Regulator Gains - Kp	
Description	• Parameter which determines the responsiveness of position control • Change set value according to rigidity of load
Parameter	[Ft-1.35]
Range:	0~700
Default:	20
Units:	Hz
Applicable Operating Mode:	Position

When Enabled	Immediately
Drive - Tuning – 3rd Regulator Gains - Low Pass Filter Bandwidth (IReg)	
Description	Suppresses high frequency components of torque command
Parameter	[Ft-1.36]
Range:	0~10000
Default:	300
Units:	Hz
Applicable Operating Mode:	All
When Enabled	Immediately

Drive - Tuning – 4th Regulator Gains	
Drive - Tuning – 4th Regulator Gains - P	
Description	Parameter which determines the responsiveness of speed control
Parameter	[Ft-1.38]
Range:	0-10000
Default:	60
Units:	-
Applicable Operating Mode:	Follower, Analog Velocity, Preset
When Enabled	Immediately
Drive - Tuning – 4th Regulator Gains - Integrator Gain	
Description	• Removes steady state speed tolerance. • Overshoot in speed response can occur if set value is too large.
Parameter	[Ft-1.39]
Range:	0~60000
Default:	26
Units:	-
Applicable Operating Mode:	Follower, Analog Velocity, Preset
When Enabled	Immediately
Drive - Tuning – 4th Regulator Gains - Low Pass Filter Bandwidth (VReg)	
Description	Sets low pass cutoff frequency of speed command to suppress high frequency components.
Parameter	[Ft-1.42]
Range:	0~10000
Default:	1000
Units:	Hz
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Tuning – 4th Regulator Gains - Kp	
Description	• Parameter which determines the responsiveness of position control • Change set value according to rigidity of load
Parameter	[Ft-1.40]
Range:	0~700
Default:	20
Units:	Hz
Applicable Operating	Position

Mode:	
When Enabled	Immediately
Drive - Tuning – 4th Regulator Gains - Low Pass Filter Bandwidth (IReg)	
Description	Suppresses high frequency components of torque command
Parameter	[Ft-1.41]
Range:	0~10000
Default:	300
Units:	Hz
Applicable Operating Mode:	All
When Enabled	Immediately

The following statuses are displayed by default for the Tuning branch of an on-line drive:

Status	Description
Velocity Loop	
Command Velocity	The commanded motor velocity.
Feedback Velocity	The actual motor velocity.
Error	The difference between commanded motor velocity (Velocity Command) and actual motor velocity (Velocity Motor Feedback).
Position Loop	
Master Position	The commanded motor position
Follower Position	The actual motor position
Error	The difference between commanded motor position (Position Command) and actual motor position (Position Feedback).
Current Loop	
Command Current	The commanded current.

The following commands can be executed for a Motor branch of an on-line drive:

Commands	Description
Start Auto tuning	Begins the Autotuning procedure
Copy Main Gains To 2nd Gains	This command sets the values in the 2nd, 3rd, and 4th Gain Values section by copying the values set in Main Gains. Note: For KNX3 Drive, the command is "Copy Main Gains To Alternate".
Copy Main Gains To 3rd Gains	
Copy Main Gains To 4th Gains	
Copy Main Gains To all Gains	
Save Parameters	Saves the current working values as power-up values in flash memory for the selected On-Line drive and all of its children

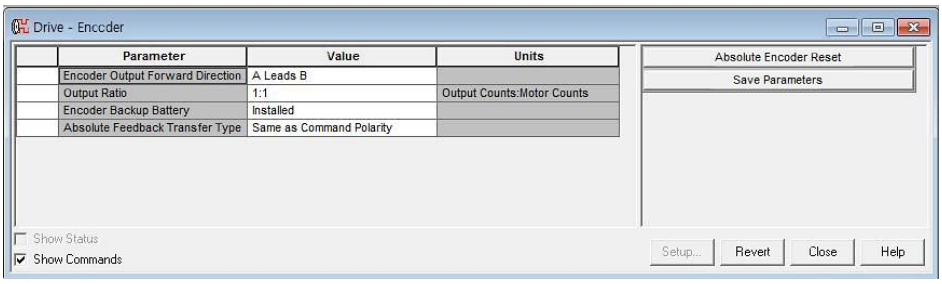
Customize the Manual Velocity Tuning window for your CSD5 Drive branch by selecting one or more of the following buttons:

- Toggle the **Show Status** selection to display or hide the Status pane.
- Toggle the **Show Commands** selection to display or hide the Commands pane.
- Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Understanding the Encoders Window

The Properties window for Encoders looks like this:

Note: The Properties window for Encoders of CSD5 Drive and KNX3 Drive are not same. The below is an illustration of CSD5 Drive.



Use the Encoders window to describe the motor and auxiliary encoders, by:

- configuring the motor encoder.

This window has the following parameters:

Drive - Encoders			
Drive - Encoders - Encoder Output Forward Direction			
Description	Configure Encoder Output Forward Direction		
Parameter	[Ft-3.00]-Digit2		
Range:	Select:	Description	Value
	A Leads B	During Forward Rotation, Encoder Output Phase A have a lead of 90 over Phase B.	0x0
	B Leads A	During Forward Rotation, Encoder Output Phase B have a lead of 90 over Phase A.	0x1
Default:	A Leads B		
Applicable Operating Mode:	Follower		
When Enabled	Servo-Off -> Setting		
Drive - Encoders - Output Ratio			

Description	First number: Denominator of Position output pulse adjustment. Second number: Numerator of Position output pulse adjustment. • Sets the number of pulses to be output through the servo drive's encoder signal output (EA+, EA-, EB+, EB-) for one motor rotation. • At [Ft-3.03], the numerator of the encoder's output divider ratio is entered. Generally, the number of pulses to be output at 1 motor rotation is entered. • At [Ft-3.04], the denominator of the encoder's output divider ratio is entered. Generally, the number of pulses output from the encoder connected to the motor for 1 rotation is entered. • For the encoder output division ratio, the relationship [Ft-3.03]≤[Ft-3.04] has to be satisfied. • For the No. of output pulses per rotation to the higher level controller: ([Ft-3.03]/[Ft-3.04]) × . of output pulses per rotation = Output to higher level controller		
Parameter	[Ft-3.04]-First number, [Ft-3.04]-second number		
Range:	1~32768		
Default:	1:1		
Units:	Output Counts : Motor Counts		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		
Drive - Encoders - Encoder Backup Battery			
Description	Sets whether battery should be used when using serial absolute value encoder.		
Parameter	[Ft-0.05]-Digit0		
Range:	Select:	Description	Value
	Installed	Backup Battery Installed	0x0
	Not Installed	Backup Battery Not Installed	0x1
Default:	Installed		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting -> After power cycle		
Drive - Encoders - Absolute Feedback Transfer Type			
Description	Define the polarity of absolute encoder data		
Parameter	[Ft-0.06]-Digit3		
Range:	Select:	Description	Value
	Same as Command Polarity	Absolute encoder data's polarity is changed by command Polarity	0x0
	Always CCW	Absolute encoder data's polarity is fixed as CCW direction	0x1
	Always CW	Absolute encoder data's polarity is fixed as CC direction	0x2
Default:	Same as Command Polarity		
Applicable Operating Mode:	All		
When Enabled	Immediately		

The following commands can be executed on an on-line drive using the Encoders window:

Commands	Description
Absolute Encoder Reset	Reset Absolute Encoder
Save Parameters	Save Parameters

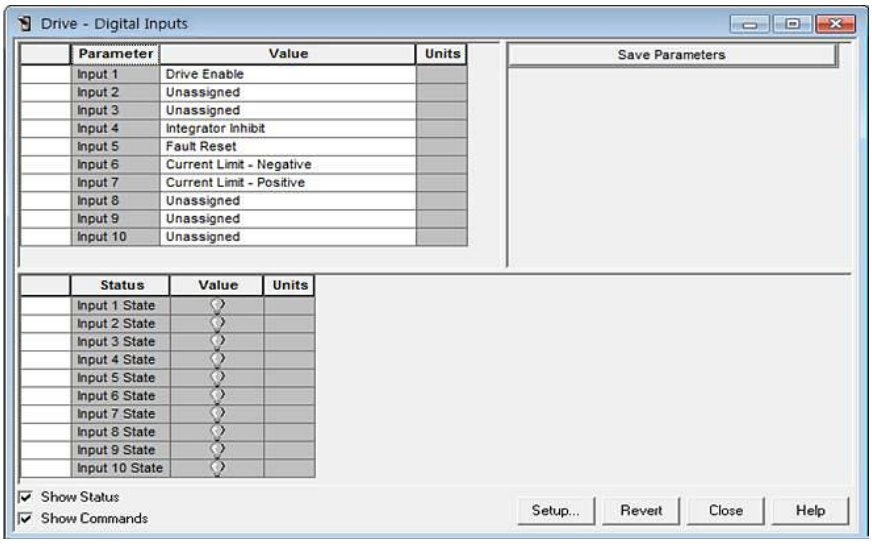
Customize the Encoders window for your CSD5 Drive branch by selecting one or more of the following buttons:

- Toggle the **Show Status** selection to display or hide the Status pane.
- Toggle the **Show Commands** selection to display or hide the Commands pane.
- Click on the **Setup** button to open the Monitor Setup window as shown on page 112, where you can customize the status display for this window.
- Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Understanding the Digital Inputs Window

The Properties window for Digital Inputs looks like this:

Note: The Properties window for Digital Inputs of KNX3 and CSD5 look like same, but the input setting is different. For One Input, only one can set for CSD5 Drive, but many more can be set for KNX3 Drive.



Use the Digital Inputs window to:

- assign functionality to digital inputs, and
- monitor the status of digital inputs.

Selecting a function in the Value selection box causes that function to become active when the associated Digital Input becomes active.

ATTEN- 	By default, Input 1 is assigned the function Drive Enable. If you change the assignments so that Drive Enable is not assigned to any input, the drive automatically enable on power-up. Be aware that, in this case, the motor may start moving on power-up.

Note: Preset Selects 0 through 5 are a special case. Instead of activating a function, Preset Selects 1 through 6 contributes a binary value when a digital input becomes active. The drive sums the binary values and uses the resulting integer to determine which Preset Position, Preset Velocity, Preset Current, Preset Follower Gearing Ratio or Index is used.

The digital input Preset Select binary values are as follows:

- Preset Select 1 = 1 if active, 0 if not.
- Preset Select 2 = 2 if active, 0 if not.
- Preset Select 3 = 4 if active, 0 if not.
- Preset Select 4 = 8 if active, 0 if not.
- Preset Select 5 = 16 if active, 0 if not.
- Preset Select 6 = 32 if active, 0 if not.

If a Preset Select is not assigned to a digital input, the Preset Select is considered inactive.

The drive uses only the Preset Select 1, 2 and3 binary values (yielding values 1~7) when the drive's Operation mode is set to Preset Position, Preset Velocity, Preset Current and Preset Follower (Gearing Ratio).

The drive uses all six Preset Select binary values (yielding values 0~ 63) when the drive's Operation mode is set to Indexing.

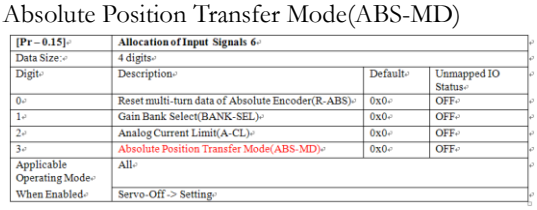
There are no commands associated with the Digital Inputs parameter window. This window has the following parameters and statuses:

Drive – Digital Inputs			
Drive - Digital Inputs- Input 1			
Description	Select the drive's digital input assignments.		
Parameter	[Ft-0.22]~ [Ft-0.27]		
Range:	Select:	Description	Value
	Unassigned	Unassigned	
	Alternate Gain Select	Alternate Gain Select(G-SEL)	[Ft-0.13]-Digit2
	Current Limit - Positive	Positive Current Limit(P-TL)	[Ft-0.11]-Digit2
	Current Limit - Negative	Negative Current Limit(N-TL)	[Ft-0.11]-Digit1
	Drive Enable	Drive Enable(SV-ON)	[Ft-0.10]-Digit0
	Fault Reset	Fault Reset(A-RST)	[Ft-0.11]-Digit0
	Integrator Inhibit	Integrator Inhibit(P-CON)	[Ft-0.10]-Digit3
	Operation Mode Override	Operation Mode Override(C-SEL)	[Ft-0.11]-Digit3
	Overtravel - Negative	Negative Over-travel(N-OT)	[Ft-0.10]-Digit2
	Overtravel - Positive	Positive Over-travel(P-OT)	[Ft-0.10]-Digit1
	Pause Follower	Pause Follower(INHIBIT)	[Ft-0.13]-Digit1
	Position Strobe	Position Strobe(ABS-DT)	[Ft-0.14]-Digit0

	Velocity Direction	Preset Direction(C-DIR)	[Ft-0.12]-Digit0
	Preset Select 1	Preset Select 1(C-SP1)	[Ft-0.12]-Digit1
	Preset Select 2	Preset Select 2(C-SP2)	[Ft-0.12]-Digit2
	Preset Select 3	Preset Select 3(C-SP3)	[Ft-0.12]-Digit3
	Reset Multiturn Data	Reset multi-turn data of Absolute Encoder(R-ABS)	[Ft-0.15]-Digit0
	Zero Speed Clamp Enable	Zero Speed Clamp Enable(Z-CLP)	[Ft-0.13]-Digit0
	Position Clear	Position clear(PCLR)	[Ft-0.13]-Digit3
	Moving Enable	Motor Moving Enable (START).	[Ft-0.14]-Digit1
	Analog Speed Command Enable	Analog Speed Command Select (C-SP4)	[Ft-0.14]-Digit2
	2nd Electronic Gear Bank Selection	2nd Electronic Gear Bank Selection(GEAR)	[Ft-0.14]-Digit3
	Home Sensor	Home Sensor(H-SENS)	[Ft-0.16]-Digit0
	Start Homing	Start Homing(SHOME)	[Ft-0.16]-Digit1
	Stop Indexing	Stop Indexing(STOP)	[Ft-0.16]-Digit2
	Pause Indexing	Pause Indexing(PAUSE)	[Ft-0.16]-Digit3
	Index Select0 Input	Index Select 0 Input(I-SEL0)	[Ft-0.17]-Digit0
	Index Select1 Input	Index Select 1 Input(I-SEL1)	[Ft-0.17]-Digit1
	Index Select2 Input	Index Select 2 Input(I-SEL2)	[Ft-0.17]-Digit2
	Index Select3 Input	Index Select 3 Input(I-SEL3)	[Ft-0.17]-Digit3
	Index Select4 Input	Index Select 4 Input(I-SEL4)	[Ft-0.18]-Digit0
	Index Select5 Input	Index Select 5 Input(I-SEL5)	[Ft-0.18]-Digit1
	Stop Homing	Stop Homing(H-STOP)	[Ft-0.18]-Digit2
	Start Indexing	Start Index(START-I)	[Ft-0.18]-Digit3
	Current Limit-Analog	Analog Current Limit(A-CL)	[Ft-0.15]-Digit1
	Absolute Position Transfer Mode	Absolute Position Transfer Mode(ABS-MD) [Pr – 0.15] Allocation of Input Signals 6 Data Size: 4 digits Digit / Description / Default / Unmapped IO Status 0 / Reset multi-turn data of Absolute Encoder(R-ABS) / 0x0 / OFF 1 / Gain Bank Select(BANK-SEL) / 0x0 / OFF 2 / Analog Current Limit(A-CL) / 0x0 / OFF 3 / Absolute Position Transfer Mode(ABS-MD) / 0x0 / OFF Applicable Operating Mode: All When Enabled: Servo-Off -> Setting Please refer to the above content.	[Ft-0.15]-Digit2
	Current Limit-Analog	Analog Current Limit(A-CL) Note: This parameter is only added for CSD5 Drive	[Ft-0.15]-Digit3
Default:	Drive Enable		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		
Drive - Digital Inputs- Input 2			
Description	Select the drive's digital input assignments.		
Parameter	[Ft-0.22]~ [Ft-0.27]		
Range:	Select:	Description	Value
	Unassigned	Unassigned	
	Alternate Gain Select	Alternate Gain Select(G-SEL)	[Ft-0.13]-Digit2
	Current Limit - Positive	Positive Current Limit(P-TL)	[Ft-0.11]-Digit2
	Current Limit - Negative	Negative Current Limit(N-TL)	[Ft-0.11]-Digit1
	Drive Enable	Drive Enable(SV-ON)	[Ft-0.10]-Digit0
	Fault Reset	Fault Reset(A-RST)	[Ft-0.11]-Digit0
	Integrator Inhibit	Integrator Inhibit(P-CON)	[Ft-0.10]-Digit3

	Operation Mode Override	Operation Mode Override(C-SEL)	[Ft-0.11]-Digit3
	Overtravel - Negative	Negative Over-travel(N-OT)	[Ft-0.10]-Digit2
	Overtravel - Positive	Positive Over-travel(P-OT)	[Ft-0.10]-Digit1
	Pause Follower	Pause Follower(INHIBIT)	[Ft-0.13]-Digit1
	Position Strobe	Position Strobe(ABS-DT)	[Ft-0.14]-Digit0
	Velocity Direction	Preset Direction(C-DIR)	[Ft-0.12]-Digit0
	Preset Select 1	Preset Select 1(C-SP1)	[Ft-0.12]-Digit1
	Preset Select 2	Preset Select 2(C-SP2)	[Ft-0.12]-Digit2
	Preset Select 3	Preset Select 3(C-SP3)	[Ft-0.12]-Digit3
	Reset Multiturn Data	Reset multi-turn data of Absolute Encoder(R-ABS)	[Ft-0.15]-Digit0
	Zero Speed Clamp Enable	Zero Speed Clamp Enable(Z-CLP)	[Ft-0.13]-Digit0
	Position Clear	Position clear(PCLR)	[Ft-0.13]-Digit3
	Moving Enable	Motor Moving Enable (START).	[Ft-0.14]-Digit1
	Analog Speed Command Enable	Analog Speed Command Select (C-SP4)	[Ft-0.14]-Digit2
	2nd Electronic Gear Bank Selection	2nd Electronic Gear Bank Selection(GEAR)	[Ft-0.14]-Digit3
	Home Sensor	Home Sensor(H-SENS)	[Ft-0.16]-Digit0
	Start Homing	Start Homing(SHOME)	[Ft-0.16]-Digit1
	Stop Indexing	Stop Indexing(STOP)	[Ft-0.16]-Digit2
	Pause Indexing	Pause Indexing(PAUSE)	[Ft-0.16]-Digit3
	Index Select0 Input	Index Select 0 Input(I-SEL0)	[Ft-0.17]-Digit0
	Index Select1 Input	Index Select 1 Input(I-SEL1)	[Ft-0.17]-Digit1
	Index Select2 Input	Index Select 2 Input(I-SEL2)	[Ft-0.17]-Digit2
	Index Select3 Input	Index Select 3 Input(I-SEL3)	[Ft-0.17]-Digit3
	Index Select4 Input	Index Select 4 Input(I-SEL4)	[Ft-0.18]-Digit0
	Index Select5 Input	Index Select 5 Input(I-SEL5)	[Ft-0.18]-Digit1
	Stop Homing	Stop Homing(H-STOP)	[Ft-0.18]-Digit2
	Start Indexing	Start Index(START-I)	[Ft-0.18]-Digit3
	Current Limit-Analog	Analog Current Limit(A-CL)	[Ft-0.15]-Digit1
	Absolute Position Transfer Mode	Absolute Position Transfer Mode(ABS-MD) [Pr – 0.15] Allocation of Input Signals 6 Data Size: 4 digits Digit / Description / Default / Unmapped IO Status 0 / Reset multi-turn data of Absolute Encoder(R-ABS) / 0x0 / OFF 1 / Gain Bank Select(BANK-SEL) / 0x0 / OFF 2 / Analog Current Limit(A-CL) / 0x0 / OFF 3 / Absolute Position Transfer Mode(ABS-MD) / 0x0 / OFF Applicable Operating Mode: All When Enabled: Servo-Off -> Setting Please refer to the above content.	[Ft-0.15]-Digit2
	Current Limit-Analog	Analog Current Limit(A-CL) Note: This parameter is only added for CSD5 Drive	[Ft-0.15]-Digit3
Default:	Home Sensor		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		
Drive - Digital Inputs- Input 3			
Description	Select the drive's digital input assignments.		
Parameter	[Ft-0.22]~ [Ft-0.27]		
Range:	Select:	Description	Value
	Unassigned	Unassigned	
	Alternate Gain Select	Alternate Gain Select(G-SEL)	[Ft-0.13]-Digit2

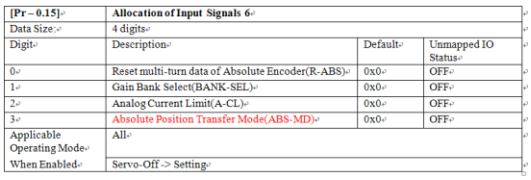
	Current Limit - Positive	Positive Current Limit(P-TL)	[Ft-0.11]-Digit2
	Current Limit - Negative	Negative Current Limit(N-TL)	[Ft-0.11]-Digit1
	Drive Enable	Drive Enable(SV-ON)	[Ft-0.10]-Digit0
	Fault Reset	Fault Reset(A-RST)	[Ft-0.11]-Digit0
	Integrator Inhibit	Integrator Inhibit(P-CON)	[Ft-0.10]-Digit3
	Operation Mode Override	Operation Mode Override(C-SEL)	[Ft-0.11]-Digit3
	Overtravel - Negative	Negative Over-travel(N-OT)	[Ft-0.10]-Digit2
	Overtravel - Positive	Positive Over-travel(P-OT)	[Ft-0.10]-Digit1
	Pause Follower	Pause Follower(INHIBIT)	[Ft-0.13]-Digit1
	Position Strobe	Position Strobe(ABS-DT)	[Ft-0.14]-Digit0
	Velocity Direction	Preset Direction(C-DIR)	[Ft-0.12]-Digit0
	Preset Select 1	Preset Select 1(C-SP1)	[Ft-0.12]-Digit1
	Preset Select 2	Preset Select 2(C-SP2)	[Ft-0.12]-Digit2
	Preset Select 3	Preset Select 3(C-SP3)	[Ft-0.12]-Digit3
	Reset Multiturn Data	Reset multi-turn data of Absolute Encoder(R-ABS)	[Ft-0.15]-Digit0
	Zero Speed Clamp Enable	Zero Speed Clamp Enable(Z-CLP)	[Ft-0.13]-Digit0
	Position Clear	Position clear(PCLR)	[Ft-0.13]-Digit3
	Moving Enable	Motor Moving Enable (START).	[Ft-0.14]-Digit1
	Analog Speed Command Enable	Analog Speed Command Select (C-SP4)	[Ft-0.14]-Digit2
	2nd Electronic Gear Bank Selection	2nd Electronic Gear Bank Selection(GEAR)	[Ft-0.14]-Digit3
	Home Sensor	Home Sensor(H-SENS)	[Ft-0.16]-Digit0
	Start Homing	Start Homing(SHOME)	[Ft-0.16]-Digit1
	Stop Indexing	Stop Indexing(STOP)	[Ft-0.16]-Digit2
	Pause Indexing	Pause Indexing(PAUSE)	[Ft-0.16]-Digit3
	Index Select0 Input	Index Select 0 Input(I-SEL0)	[Ft-0.17]-Digit0
	Index Select1 Input	Index Select 1 Input(I-SEL1)	[Ft-0.17]-Digit1
	Index Select2 Input	Index Select 2 Input(I-SEL2)	[Ft-0.17]-Digit2
	Index Select3 Input	Index Select 3 Input(I-SEL3)	[Ft-0.17]-Digit3
	Index Select4 Input	Index Select 4 Input(I-SEL4)	[Ft-0.18]-Digit0
	Index Select5 Input	Index Select 5 Input(I-SEL5)	[Ft-0.18]-Digit1
	Stop Homing	Stop Homing(H-STOP)	[Ft-0.18]-Digit2
	Start Indexing	Start Index(START-I)	[Ft-0.18]-Digit3
	Current Limit-Analog	Analog Current Limit(A-CL)	[Ft-0.15]-Digit1
	Absolute Position Transfer Mode	Absolute Position Transfer Mode(ABS-MD) [Pr – 0.15] Allocation of Input Signals 6 Data Size: 4 digits Digit / Description / Default / Unmapped IO Status 0 / Reset multi-turn data of Absolute Encoder(R-ABS) / 0x0 / OFF 1 / Gain Bank Select(BANK-SEL) / 0x0 / OFF 2 / Analog Current Limit(A-CL) / 0x0 / OFF 3 / Absolute Position Transfer Mode(ABS-MD) / 0x0 / OFF Applicable Operating Mode: All When Enabled: Servo-Off -> Setting Please refer to the above content.	[Ft-0.15]-Digit2
	Current Limit-Analog	Analog Current Limit(A-CL) Note: This parameter is only added for CSD5 Drive	[Ft-0.15]-Digit3
Default:	Start Homing		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		
Drive - Digital Inputs- Input 4			
Description	Select the drive's digital input assignments.		

<table>
<tr><td>Parameter</td><td colspan="3">[Ft-0.22]~ [Ft-0.27]</td></tr>
<tr><td rowspan="39">Range:</td><td>Select:</td><td>Description</td><td>Value</td></tr>
<tr><td>Unassigned</td><td>Unassigned</td><td></td></tr>
<tr><td>Alternate Gain Select</td><td>Alternate Gain Select(G-SEL)</td><td>[Ft-0.13]-Digit2</td></tr>
<tr><td>Current Limit - Positive</td><td>Positive Current Limit(P-TL)</td><td>[Ft-0.11]-Digit2</td></tr>
<tr><td>Current Limit - Negative</td><td>Negative Current Limit(N-TL)</td><td>[Ft-0.11]-Digit1</td></tr>
<tr><td>Drive Enable</td><td>Drive Enable(SV-ON)</td><td>[Ft-0.10]-Digit0</td></tr>
<tr><td>Fault Reset</td><td>Fault Reset(A-RST)</td><td>[Ft-0.11]-Digit0</td></tr>
<tr><td>Integrator Inhibit</td><td>Integrator Inhibit(P-CON)</td><td>[Ft-0.10]-Digit3</td></tr>
<tr><td>Operation Mode Override</td><td>Operation Mode Override(C-SEL)</td><td>[Ft-0.11]-Digit3</td></tr>
<tr><td>Overtravel - Negative</td><td>Negative Over-travel(N-OT)</td><td>[Ft-0.10]-Digit2</td></tr>
<tr><td>Overtravel - Positive</td><td>Positive Over-travel(P-OT)</td><td>[Ft-0.10]-Digit1</td></tr>
<tr><td>Pause Follower</td><td>Pause Follower(INHIBIT)</td><td>[Ft-0.13]-Digit1</td></tr>
<tr><td>Position Strobe</td><td>Position Strobe(ABS-DT)</td><td>[Ft-0.14]-Digit0</td></tr>
<tr><td>Velocity Direction</td><td>Preset Direction(C-DIR)</td><td>[Ft-0.12]-Digit0</td></tr>
<tr><td>Preset Select 1</td><td>Preset Select 1(C-SP1)</td><td>[Ft-0.12]-Digit1</td></tr>
<tr><td>Preset Select 2</td><td>Preset Select 2(C-SP2)</td><td>[Ft-0.12]-Digit2</td></tr>
<tr><td>Preset Select 3</td><td>Preset Select 3(C-SP3)</td><td>[Ft-0.12]-Digit3</td></tr>
<tr><td>Reset Multiturn Data</td><td>Reset multi-turn data of Absolute Encoder(R-ABS)</td><td>[Ft-0.15]-Digit0</td></tr>
<tr><td>Zero Speed Clamp Enable</td><td>Zero Speed Clamp Enable(Z-CLP)</td><td>[Ft-0.13]-Digit0</td></tr>
<tr><td>Position Clear</td><td>Position clear(PCLR)</td><td>[Ft-0.13]-Digit3</td></tr>
<tr><td>Moving Enable</td><td>Motor Moving Enable (START).</td><td>[Ft-0.14]-Digit1</td></tr>
<tr><td>Analog Speed Command Enable</td><td>Analog Speed Command Select (C-SP4)</td><td>[Ft-0.14]-Digit2</td></tr>
<tr><td>2nd Electronic Gear Bank Selection</td><td>2nd Electronic Gear Bank Selection(GEAR)</td><td>[Ft-0.14]-Digit3</td></tr>
<tr><td>Home Sensor</td><td>Home Sensor(H-SENS)</td><td>[Ft-0.16]-Digit0</td></tr>
<tr><td>Start Homing</td><td>Start Homing(SHOME)</td><td>[Ft-0.16]-Digit1</td></tr>
<tr><td>Stop Indexing</td><td>Stop Indexing(STOP)</td><td>[Ft-0.16]-Digit2</td></tr>
<tr><td>Pause Indexing</td><td>Pause Indexing(PAUSE)</td><td>[Ft-0.16]-Digit3</td></tr>
<tr><td>Index Select0 Input</td><td>Index Select 0 Input(I-SEL0)</td><td>[Ft-0.17]-Digit0</td></tr>
<tr><td>Index Select1 Input</td><td>Index Select 1 Input(I-SEL1)</td><td>[Ft-0.17]-Digit1</td></tr>
<tr><td>Index Select2 Input</td><td>Index Select 2 Input(I-SEL2)</td><td>[Ft-0.17]-Digit2</td></tr>
<tr><td>Index Select3 Input</td><td>Index Select 3 Input(I-SEL3)</td><td>[Ft-0.17]-Digit3</td></tr>
<tr><td>Index Select4 Input</td><td>Index Select 4 Input(I-SEL4)</td><td>[Ft-0.18]-Digit0</td></tr>
<tr><td>Index Select5 Input</td><td>Index Select 5 Input(I-SEL5)</td><td>[Ft-0.18]-Digit1</td></tr>
<tr><td>Stop Homing</td><td>Stop Homing(H-STOP)</td><td>[Ft-0.18]-Digit2</td></tr>
<tr><td>Start Indexing</td><td>Start Index(START-I)</td><td>[Ft-0.18]-Digit3</td></tr>
<tr><td>Current Limit-Analog</td><td>Analog Current Limit(A-CL)</td><td>[Ft-0.15]-Digit1</td></tr>
<tr><td>Absolute Position Transfer Mode</td><td>Absolute Position Transfer Mode(ABS-MD)
 
Please refer to the above content.</td><td>[Ft-0.15]-Digit2</td></tr>
<tr><td>Current Limit-Analog</td><td>Analog Current Limit(A-CL)
Note: This parameter is only added for CSD5 Drive</td><td>[Ft-0.15]-Digit3</td></tr>
<tr><td>Default:</td><td colspan="3">Start Indexing</td></tr>
<tr><td>Applicable</td><td colspan="3">All</td></tr>
</table>

Operating Mode:			
When Enabled	Servo-Off -> Setting		
Drive - Digital Inputs- Input 5			
Description	Select the drive's digital input assignments.		
Parameter	[Ft-0.22]~ [Ft-0.27]		
Range:	Select:	Description	Value
	Unassigned	Unassigned	
	Alternate Gain Select	Alternate Gain Select(G-SEL)	[Ft-0.13]-Digit2
	Current Limit - Positive	Positive Current Limit(P-TL)	[Ft-0.11]-Digit2
	Current Limit - Negative	Negative Current Limit(N-TL)	[Ft-0.11]-Digit1
	Drive Enable	Drive Enable(SV-ON)	[Ft-0.10]-Digit0
	Fault Reset	Fault Reset(A-RST)	[Ft-0.11]-Digit0
	Integrator Inhibit	Integrator Inhibit(P-CON)	[Ft-0.10]-Digit3
	Operation Mode Override	Operation Mode Override(C-SEL)	[Ft-0.11]-Digit3
	Overtravel - Negative	Negative Over-travel(N-OT)	[Ft-0.10]-Digit2
	Overtravel - Positive	Positive Over-travel(P-OT)	[Ft-0.10]-Digit1
	Pause Follower	Pause Follower(INHIBIT)	[Ft-0.13]-Digit1
	Position Strobe	Position Strobe(ABS-DT)	[Ft-0.14]-Digit0
	Velocity Direction	Preset Direction(C-DIR)	
	Preset Select 1	Preset Select 1(C-SP1)	[Ft-0.12]-Digit1
	Preset Select 2	Preset Select 2(C-SP2)	[Ft-0.12]-Digit2
	Preset Select 3	Preset Select 3(C-SP3)	[Ft-0.12]-Digit3
	Reset Multiturn Data	Reset multi-turn data of Absolute Encoder(R-ABS)	[Ft-0.15]-Digit0
	Zero Speed Clamp Enable	Zero Speed Clamp Enable(Z-CLP)	[Ft-0.13]-Digit0
	Position Clear	Position clear(PCLR)	[Ft-0.13]-Digit3
	Moving Enable	Motor Moving Enable (START).	[Ft-0.14]-Digit1
	Analog Speed Command Enable	Analog Speed Command Select (C-SP4)	[Ft-0.14]-Digit2
	2nd Electronic Gear Bank Selection	2nd Electronic Gear Bank Selection(GEAR)	[Ft-0.14]-Digit3
	Home Sensor	Home Sensor(H-SENS)	[Ft-0.16]-Digit0
	Start Homing	Start Homing(SHOME)	[Ft-0.16]-Digit1
	Stop Indexing	Stop Indexing(STOP)	[Ft-0.16]-Digit2
	Pause Indexing	Pause Indexing(PAUSE)	[Ft-0.16]-Digit3
	Index Select0 Input	Index Select 0 Input(I-SEL0)	[Ft-0.17]-Digit0
	Index Select1 Input	Index Select 1 Input(I-SEL1)	[Ft-0.17]-Digit1
	Index Select2 Input	Index Select 2 Input(I-SEL2)	[Ft-0.17]-Digit2
	Index Select3 Input	Index Select 3 Input(I-SEL3)	[Ft-0.17]-Digit3
	Index Select4 Input	Index Select 4 Input(I-SEL4)	[Ft-0.18]-Digit0
	Index Select5 Input	Index Select 5 Input(I-SEL5)	[Ft-0.18]-Digit1
	Stop Homing	Stop Homing(H-STOP)	[Ft-0.18]-Digit2
	Start Indexing	Start Index(START-I)	[Ft-0.18]-Digit3
	Current Limit-Analog	Analog Current Limit(A-CL)	[Ft-0.15]-Digit1

<table>
<tr><td></td><td>Absolute Position Transfer Mode</td><td>Absolute Position Transfer Mode(ABS-MD)
<table><tr><td>[Pr－0.15]</td><td colspan="3">Allocation of Input Signals 6</td></tr><tr><td>Data Size:</td><td colspan="3">4 digits</td></tr><tr><td>Digit</td><td>Description</td><td>Default</td><td>Unmapped IO Status</td></tr><tr><td>0</td><td>Reset multi-turn data of Absolute Encoder(R-ABS)</td><td>0x0</td><td>OFF</td></tr><tr><td>1</td><td>Gain Bank Select(BANK-SEL)</td><td>0x0</td><td>OFF</td></tr><tr><td>2</td><td>Analog Current Limit(A-CL)</td><td>0x0</td><td>OFF</td></tr><tr><td>3</td><td>Absolute Position Transfer Mode(ABS-MD)</td><td>0x0</td><td>OFF</td></tr><tr><td>Applicable Operating Mode</td><td colspan="3">All</td></tr><tr><td>When Enabled</td><td colspan="3">Servo-Off -> Setting</td></tr></table>Please refer to the above content.</td><td>[Ft-0.15]-Digit2</td></tr>
<tr><td></td><td>Current Limit-Analog</td><td>Analog Current Limit(A-CL)
Note: This parameter is only added for CSD5 Drive</td><td>[Ft-0.15]-Digit3</td></tr>
<tr><td>Default:</td><td colspan="3">Index Select 0 Input</td></tr>
<tr><td>Applicable Operating Mode:</td><td colspan="3">All</td></tr>
<tr><td>When Enabled</td><td colspan="3">Servo-Off -> Setting</td></tr>
<tr><td colspan="4">Drive - Digital Inputs- Input 6</td></tr>
<tr><td>Description</td><td colspan="3">Select the drive's digital input assignments.</td></tr>
<tr><td>Parameter</td><td colspan="3">[Ft-0.22]~ [Ft-0.27]</td></tr>
<tr><td rowspan="39">Range:</td><td>Select:</td><td>Description</td><td>Value</td></tr>
<tr><td>Unassigned</td><td>Unassigned</td><td>[Ft-0.12]-Digit0</td></tr>
<tr><td>Alternate Gain Select</td><td>Alternate Gain Select(G-SEL)</td><td>[Ft-0.13]-Digit2</td></tr>
<tr><td>Current Limit - Positive</td><td>Positive Current Limit(P-TL)</td><td>[Ft-0.11]-Digit2</td></tr>
<tr><td>Current Limit - Negative</td><td>Negative Current Limit(N-TL)</td><td>[Ft-0.11]-Digit1</td></tr>
<tr><td>Drive Enable</td><td>Drive Enable(SV-ON)</td><td>[Ft-0.10]-Digit0</td></tr>
<tr><td>Fault Reset</td><td>Fault Reset(A-RST)</td><td>[Ft-0.11]-Digit0</td></tr>
<tr><td>Integrator Inhibit</td><td>Integrator Inhibit(P-CON)</td><td>[Ft-0.10]-Digit3</td></tr>
<tr><td>Operation Mode Override</td><td>Operation Mode Override(C-SEL)</td><td>[Ft-0.11]-Digit3</td></tr>
<tr><td>Overtravel - Negative</td><td>Negative Over-travel(N-OT)</td><td>[Ft-0.10]-Digit2</td></tr>
<tr><td>Overtravel - Positive</td><td>Positive Over-travel(P-OT)</td><td>[Ft-0.10]-Digit1</td></tr>
<tr><td>Pause Follower</td><td>Pause Follower(INHIBIT)</td><td>[Ft-0.13]-Digit1</td></tr>
<tr><td>Position Strobe</td><td>Position Strobe(ABS-DT)</td><td>[Ft-0.14]-Digit0</td></tr>
<tr><td>Velocity Direction</td><td>Preset Direction(C-DIR)</td><td></td></tr>
<tr><td>Preset Select 1</td><td>Preset Select 1(C-SP1)</td><td>[Ft-0.12]-Digit1</td></tr>
<tr><td>Preset Select 2</td><td>Preset Select 2(C-SP2)</td><td>[Ft-0.12]-Digit2</td></tr>
<tr><td>Preset Select 3</td><td>Preset Select 3(C-SP3)</td><td>[Ft-0.12]-Digit3</td></tr>
<tr><td>Reset Multiturn Data</td><td>Reset multi-turn data of Absolute Encoder(R-ABS)</td><td>[Ft-0.15]-Digit0</td></tr>
<tr><td>Zero Speed Clamp Enable</td><td>Zero Speed Clamp Enable(Z-CLP)</td><td>[Ft-0.13]-Digit0</td></tr>
<tr><td>Position Clear</td><td>Position clear(PCLR)</td><td>[Ft-0.13]-Digit3</td></tr>
<tr><td>Moving Enable</td><td>Motor Moving Enable (START).</td><td>[Ft-0.14]-Digit1</td></tr>
<tr><td>Analog Speed Command Enable</td><td>Analog Speed Command Select (C-SP4)</td><td>[Ft-0.14]-Digit2</td></tr>
<tr><td>2nd Electronic Gear Bank Selection</td><td>2nd Electronic Gear Bank Selection(GEAR)</td><td>[Ft-0.14]-Digit3</td></tr>
<tr><td>Home Sensor</td><td>Home Sensor(H-SENS)</td><td>[Ft-0.16]-Digit0</td></tr>
<tr><td>Start Homing</td><td>Start Homing(SHOME)</td><td>[Ft-0.16]-Digit1</td></tr>
<tr><td>Stop Indexing</td><td>Stop Indexing(STOP)</td><td>[Ft-0.16]-Digit2</td></tr>
<tr><td>Pause Indexing</td><td>Pause Indexing(PAUSE)</td><td>[Ft-0.16]-Digit3</td></tr>
<tr><td>Index Select0 Input</td><td>Index Select 0 Input(I-SEL0)</td><td>[Ft-0.17]-Digit0</td></tr>
<tr><td>Index Select1 Input</td><td>Index Select 1 Input(I-SEL1)</td><td>[Ft-0.17]-Digit1</td></tr>
<tr><td>Index Select2 Input</td><td>Index Select 2 Input(I-SEL2)</td><td>[Ft-0.17]-Digit2</td></tr>
<tr><td>Index Select3 Input</td><td>Index Select 3 Input(I-SEL3)</td><td>[Ft-0.17]-Digit3</td></tr>
</table>

	Index Select4 Input	Index Select 4 Input(I-SEL4)	[Ft-0.18]-Digit0
	Index Select5 Input	Index Select 5 Input(I-SEL5)	[Ft-0.18]-Digit1
	Stop Homing	Stop Homing(H-STOP)	[Ft-0.18]-Digit2
	Start Indexing	Start Index(START-I)	[Ft-0.18]-Digit3
	Current Limit-Analog	Analog Current Limit(A-CL)	[Ft-0.15]-Digit1
	Absolute Position Transfer Mode	Absolute Position Transfer Mode(ABS-MD) [Pr – 0.15] Allocation of Input Signals 6 Data Size: 4 digits Digit / Description / Default / Unmapped IO Status 0 / Reset multi-turn data of Absolute Encoder(R-ABS) / 0x0 / OFF 1 / Gain Bank Select(BANK-SEL) / 0x0 / OFF 2 / Analog Current Limit(A-CL) / 0x0 / OFF 3 / Absolute Position Transfer Mode(ABS-MD) / 0x0 / OFF Applicable Operating Mode: All When Enabled: Servo-Off -> Setting Please refer to the above content.	[Ft-0.15]-Digit2
	Current Limit-Analog	Analog Current Limit(A-CL) Note: This parameter is only added for CSD5 Drive	[Ft-0.15]-Digit3
Default:	Index Select 1 Input		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		
Drive - Digital Inputs- Input 4			
Description	Select the drive's digital input assignments.		
Parameter	[Ft-0.22]~ [Ft-0.27]		
Range:	Select:	Description	Value
	Unassigned	Unassigned	
	Alternate Gain Select	Alternate Gain Select(G-SEL)	[Ft-0.13]-Digit2
	Current Limit - Positive	Positive Current Limit(P-TL)	[Ft-0.11]-Digit2
	Current Limit - Negative	Negative Current Limit(N-TL)	[Ft-0.11]-Digit1
	Drive Enable	Drive Enable(SV-ON)	[Ft-0.10]-Digit0
	Fault Reset	Fault Reset(A-RST)	[Ft-0.11]-Digit0
	Integrator Inhibit	Integrator Inhibit(P-CON)	[Ft-0.10]-Digit3
	Operation Mode Override	Operation Mode Override(C-SEL)	[Ft-0.11]-Digit3
	Overtravel - Negative	Negative Over-travel(N-OT)	[Ft-0.10]-Digit2
	Overtravel - Positive	Positive Over-travel(P-OT)	[Ft-0.10]-Digit1
	Pause Follower	Pause Follower(INHIBIT)	[Ft-0.13]-Digit1
	Position Strobe	Position Strobe(ABS-DT)	[Ft-0.14]-Digit0
	Velocity Direction	Preset Direction(C-DIR)	[Ft-0.12]-Digit0
	Preset Select 1	Preset Select 1(C-SP1)	[Ft-0.12]-Digit1
	Preset Select 2	Preset Select 2(C-SP2)	[Ft-0.12]-Digit2
	Preset Select 3	Preset Select 3(C-SP3)	[Ft-0.12]-Digit3
	Reset Multiturn Data	Reset multi-turn data of Absolute Encoder(R-ABS)	[Ft-0.15]-Digit0
	Zero Speed Clamp Enable	Zero Speed Clamp Enable(Z-CLP)	[Ft-0.13]-Digit0
	Position Clear	Position clear(PCLR)	[Ft-0.13]-Digit3
	Moving Enable	Motor Moving Enable (START).	[Ft-0.14]-Digit1
	Analog Speed Command Enable	Analog Speed Command Select (C-SP4)	[Ft-0.14]-Digit2
	2nd Electronic Gear Bank Selection	2nd Electronic Gear Bank Selection(GEAR)	[Ft-0.14]-Digit3
	Home Sensor	Home Sensor(H-SENS)	[Ft-0.16]-Digit0
	Start Homing	Start Homing(SHOME)	[Ft-0.16]-Digit1

	Stop Indexing	Stop Indexing(STOP)	[Ft-0.16]-Digit2
	Pause Indexing	Pause Indexing(PAUSE)	[Ft-0.16]-Digit3
	Index Select0 Input	Index Select 0 Input(I-SEL0)	[Ft-0.17]-Digit0
	Index Select1 Input	Index Select 1 Input(I-SEL1)	[Ft-0.17]-Digit1
	Index Select2 Input	Index Select 2 Input(I-SEL2)	[Ft-0.17]-Digit2
	Index Select3 Input	Index Select 3 Input(I-SEL3)	[Ft-0.17]-Digit3
	Index Select4 Input	Index Select 4 Input(I-SEL4)	[Ft-0.18]-Digit0
	Index Select5 Input	Index Select 5 Input(I-SEL5)	[Ft-0.18]-Digit1
	Stop Homing	Stop Homing(H-STOP)	[Ft-0.18]-Digit2
	Start Indexing	Start Index(START-I)	[Ft-0.18]-Digit3
	Current Limit-Analog	Analog Current Limit(A-CL)	[Ft-0.15]-Digit1
	Absolute Position Transfer Mode	Absolute Position Transfer Mode(ABS-MD)  Please refer to the above content.	[Ft-0.15]-Digit2
	Current Limit-Analog	Analog Current Limit(A-CL) Note: This parameter is only added for CSD5 Drive	[Ft-0.15]-Digit3
Default:	Start Indexing		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		
Drive - Digital Inputs- Input 7			
Description	Select the drive's digital input assignments.		
Parameter	[Ft-0.22]~ [Ft-0.27]		
Range:	Select:	Description	Value
	Unassigned	Unassigned	
	Alternate Gain Select	Alternate Gain Select(G-SEL)	[Ft-0.13]-Digit2
	Current Limit - Positive	Positive Current Limit(P-TL)	[Ft-0.11]-Digit2
	Current Limit - Negative	Negative Current Limit(N-TL)	[Ft-0.11]-Digit1
	Drive Enable	Drive Enable(SV-ON)	[Ft-0.10]-Digit0
	Fault Reset	Fault Reset(A-RST)	[Ft-0.11]-Digit0
	Integrator Inhibit	Integrator Inhibit(P-CON)	[Ft-0.10]-Digit3
	Operation Mode Override	Operation Mode Override(C-SEL)	[Ft-0.11]-Digit3
	Overtravel - Negative	Negative Over-travel(N-OT)	[Ft-0.10]-Digit2
	Overtravel - Positive	Positive Over-travel(P-OT)	[Ft-0.10]-Digit1
	Pause Follower	Pause Follower(INHIBIT)	[Ft-0.13]-Digit1
	Position Strobe	Position Strobe(ABS-DT)	[Ft-0.14]-Digit0
	Velocity Direction	Preset Direction(C-DIR)	[Ft-0.12]-Digit0
	Preset Select 1	Preset Select 1(C-SP1)	[Ft-0.12]-Digit1
	Preset Select 2	Preset Select 2(C-SP2)	[Ft-0.12]-Digit2
	Preset Select 3	Preset Select 3(C-SP3)	[Ft-0.12]-Digit3
	Reset Multiturn Data	Reset multi-turn data of Absolute Encoder(R-ABS)	[Ft-0.15]-Digit0
	Zero Speed Clamp Enable	Zero Speed Clamp Enable(Z-CLP)	[Ft-0.13]-Digit0
	Position Clear	Position clear(PCLR)	[Ft-0.13]-Digit3
	Moving Enable	Motor Moving Enable (START).	[Ft-0.14]-Digit1

[Pr – 0.15]	Allocation of Input Signals 6		
Data Size:	4 digits		
Digit	Description	Default	Unmapped IO Status
0	Reset multi-turn data of Absolute Encoder(R-ABS)	0x0	OFF
1	Gain Bank Select(BANK-SEL)	0x0	OFF
2	Analog Current Limit(A-CL)	0x0	OFF
3	Absolute Position Transfer Mode(ABS-MD)	0x0	OFF
Applicable Operating Mode	All		
When Enabled	Servo-Off -> Setting		

	Analog Speed Command Enable	Analog Speed Command Select (C-SP4)	[Ft-0.14]-Digit2
	2nd Electronic Gear Bank Selection	2nd Electronic Gear Bank Selection(GEAR)	[Ft-0.14]-Digit3
	Home Sensor	Home Sensor(H-SENS)	[Ft-0.16]-Digit0
	Start Homing	Start Homing(SHOME)	[Ft-0.16]-Digit1
	Stop Indexing	Stop Indexing(STOP)	[Ft-0.16]-Digit2
	Pause Indexing	Pause Indexing(PAUSE)	[Ft-0.16]-Digit3
	Index Select0 Input	Index Select 0 Input(I-SEL0)	[Ft-0.17]-Digit0
	Index Select1 Input	Index Select 1 Input(I-SEL1)	[Ft-0.17]-Digit1
	Index Select2 Input	Index Select 2 Input(I-SEL2)	[Ft-0.17]-Digit2
	Index Select3 Input	Index Select 3 Input(I-SEL3)	[Ft-0.17]-Digit3
	Index Select4 Input	Index Select 4 Input(I-SEL4)	[Ft-0.18]-Digit0
	Index Select5 Input	Index Select 5 Input(I-SEL5)	[Ft-0.18]-Digit1
	Stop Homing	Stop Homing(H-STOP)	[Ft-0.18]-Digit2
	Start Indexing	Start Index(START-I)	[Ft-0.18]-Digit3
	Current Limit-Analog	Analog Current Limit(A-CL)	[Ft-0.15]-Digit1
	Absolute Position Transfer Mode	Absolute Position Transfer Mode(ABS-MD) [Pr – 0.15] Allocation of Input Signals 6 Data Size: 4 digits Digit / Description / Default / Unmapped IO Status 0 / Reset multi-turn data of Absolute Encoder(R-ABS) / 0x0 / OFF 1 / Gain Bank Select(BANK-SEL) / 0x0 / OFF 2 / Analog Current Limit(A-CL) / 0x0 / OFF 3 / Absolute Position Transfer Mode(ABS-MD) / 0x0 / OFF Applicable Operating Mode: All When Enabled: Servo-Off -> Setting Please refer to the above content.	[Ft-0.15]-Digit2
	Current Limit-Analog	Analog Current Limit(A-CL) Note: This parameter is only added for CSD5 Drive	[Ft-0.15]-Digit3
Default:	Index Select 2 Input		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		
Drive - Digital Inputs- Input 8			
Description	Select the drive's digital input assignments.		
Parameter	[Ft-0.22]~ [Ft-0.27]		
Range:	Select:	Description	Value
	Unassigned	Unassigned	
	Alternate Gain Select	Alternate Gain Select(G-SEL)	[Ft-0.13]-Digit2
	Current Limit - Positive	Positive Current Limit(P-TL)	[Ft-0.11]-Digit2
	Current Limit - Negative	Negative Current Limit(N-TL)	[Ft-0.11]-Digit1
	Drive Enable	Drive Enable(SV-ON)	[Ft-0.10]-Digit0
	Fault Reset	Fault Reset(A-RST)	[Ft-0.11]-Digit0
	Integrator Inhibit	Integrator Inhibit(P-CON)	[Ft-0.10]-Digit3
	Operation Mode Override	Operation Mode Override(C-SEL)	[Ft-0.11]-Digit3
	Overtravel - Negative	Negative Over-travel(N-OT)	[Ft-0.10]-Digit2
	Overtravel - Positive	Positive Over-travel(P-OT)	[Ft-0.10]-Digit1
	Pause Follower	Pause Follower(INHIBIT)	[Ft-0.13]-Digit1
	Position Strobe	Position Strobe(ABS-DT)	[Ft-0.14]-Digit0
	Velocity Direction	Preset Direction(C-DIR)	[Ft-0.12]-Digit0
	Preset Select 1	Preset Select 1(C-SP1)	[Ft-0.12]-Digit1
	Preset Select 2	Preset Select 2(C-SP2)	[Ft-0.12]-Digit2

	Preset Select 3	Preset Select 3(C-SP3)	[Ft-0.12]-Digit3
	Reset Multiturn Data	Reset multi-turn data of Absolute Encoder(R-ABS)	[Ft-0.15]-Digit0
	Zero Speed Clamp Enable	Zero Speed Clamp Enable(Z-CLP)	[Ft-0.13]-Digit0
	Position Clear	Position clear(PCLR)	[Ft-0.13]-Digit3
	Moving Enable	Motor Moving Enable (START).	[Ft-0.14]-Digit1
	Analog Speed Command Enable	Analog Speed Command Select (C-SP4)	[Ft-0.14]-Digit2
	2nd Electronic Gear Bank Selection	2nd Electronic Gear Bank Selection(GEAR)	[Ft-0.14]-Digit3
	Home Sensor	Home Sensor(H-SENS)	[Ft-0.16]-Digit0
	Start Homing	Start Homing(SHOME)	[Ft-0.16]-Digit1
	Stop Indexing	Stop Indexing(STOP)	[Ft-0.16]-Digit2
	Pause Indexing	Pause Indexing(PAUSE)	[Ft-0.16]-Digit3
	Index Select0 Input	Index Select 0 Input(I-SEL0)	[Ft-0.17]-Digit0
	Index Select1 Input	Index Select 1 Input(I-SEL1)	[Ft-0.17]-Digit1
	Index Select2 Input	Index Select 2 Input(I-SEL2)	[Ft-0.17]-Digit2
	Index Select3 Input	Index Select 3 Input(I-SEL3)	[Ft-0.17]-Digit3
	Index Select4 Input	Index Select 4 Input(I-SEL4)	[Ft-0.18]-Digit0
	Index Select5 Input	Index Select 5 Input(I-SEL5)	[Ft-0.18]-Digit1
	Stop Homing	Stop Homing(H-STOP)	[Ft-0.18]-Digit2
	Start Indexing	Start Index(START-I)	[Ft-0.18]-Digit3
	Current Limit-Analog	Analog Current Limit(A-CL)	[Ft-0.15]-Digit1
	Absolute Position Transfer Mode	Absolute Position Transfer Mode(ABS-MD) [Pr – 0.15] Allocation of Input Signals 6 Data Size: 4 digits Digit / Description / Default / Unmapped IO Status 0 / Reset multi-turn data of Absolute Encoder(R-ABS) / 0x0 / OFF 1 / Gain Bank Select(BANK-SEL) / 0x0 / OFF 2 / Analog Current Limit(A-CL) / 0x0 / OFF 3 / Absolute Position Transfer Mode(ABS-MD) / 0x0 / OFF Applicable Operating Mode: All When Enabled: Servo-Off -> Setting Please refer to the above content.	[Ft-0.15]-Digit2
	Current Limit-Analog	Analog Current Limit(A-CL) Note: This parameter is only added for CSD5 Drive	[Ft-0.15]-Digit3
Default:	Unassigned		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		
Drive - Digital Inputs- Input 9			
Description	Select the drive's digital input assignments.		
Parameter	[Ft-0.22]~ [Ft-0.27]		
Range:	Select:	Description	Value
	Unassigned	Unassigned	
	Alternate Gain Select	Alternate Gain Select(G-SEL)	[Ft-0.13]-Digit2
	Current Limit - Positive	Positive Current Limit(P-TL)	[Ft-0.11]-Digit2
	Current Limit - Negative	Negative Current Limit(N-TL)	[Ft-0.11]-Digit1
	Drive Enable	Drive Enable(SV-ON)	[Ft-0.10]-Digit0
	Fault Reset	Fault Reset(A-RST)	[Ft-0.11]-Digit0
	Integrator Inhibit	Integrator Inhibit(P-CON)	[Ft-0.10]-Digit3
	Operation Mode Override	Operation Mode Override(C-SEL)	[Ft-0.11]-Digit3
	Overtravel - Negative	Negative Over-travel(N-OT)	[Ft-0.10]-Digit2

	Overtravel - Positive	Positive Over-travel(P-OT)	[Ft-0.10]-Digit1
	Pause Follower	Pause Follower(INHIBIT)	[Ft-0.13]-Digit1
	Position Strobe	Position Strobe(ABS-DT)	[Ft-0.14]-Digit0
	Velocity Direction	Preset Direction(C-DIR)	[Ft-0.12]-Digit0
	Preset Select 1	Preset Select 1(C-SP1)	[Ft-0.12]-Digit1
	Preset Select 2	Preset Select 2(C-SP2)	[Ft-0.12]-Digit2
	Preset Select 3	Preset Select 3(C-SP3)	[Ft-0.12]-Digit3
	Reset Multiturn Data	Reset multi-turn data of Absolute Encoder(R-ABS)	[Ft-0.15]-Digit0
	Zero Speed Clamp Enable	Zero Speed Clamp Enable(Z-CLP)	[Ft-0.13]-Digit0
	Position Clear	Position clear(PCLR)	[Ft-0.13]-Digit3
	Moving Enable	Motor Moving Enable (START).	[Ft-0.14]-Digit1
	Analog Speed Command Enable	Analog Speed Command Select (C-SP4)	[Ft-0.14]-Digit2
	2nd Electronic Gear Bank Selection	2nd Electronic Gear Bank Selection(GEAR)	[Ft-0.14]-Digit3
	Home Sensor	Home Sensor(H-SENS)	[Ft-0.16]-Digit0
	Start Homing	Start Homing(SHOME)	[Ft-0.16]-Digit1
	Stop Indexing	Stop Indexing(STOP)	[Ft-0.16]-Digit2
	Pause Indexing	Pause Indexing(PAUSE)	[Ft-0.16]-Digit3
	Index Select0 Input	Index Select 0 Input(I-SEL0)	[Ft-0.17]-Digit0
	Index Select1 Input	Index Select 1 Input(I-SEL1)	[Ft-0.17]-Digit1
	Index Select2 Input	Index Select 2 Input(I-SEL2)	[Ft-0.17]-Digit2
	Index Select3 Input	Index Select 3 Input(I-SEL3)	[Ft-0.17]-Digit3
	Index Select4 Input	Index Select 4 Input(I-SEL4)	[Ft-0.18]-Digit0
	Index Select5 Input	Index Select 5 Input(I-SEL5)	[Ft-0.18]-Digit1
	Stop Homing	Stop Homing(H-STOP)	[Ft-0.18]-Digit2
	Start Indexing	Start Index(START-I)	[Ft-0.18]-Digit3
	Current Limit-Analog	Analog Current Limit(A-CL)	[Ft-0.15]-Digit1
	Absolute Position Transfer Mode	Absolute Position Transfer Mode(ABS-MD) [Pr – 0.15] Allocation of Input Signals 6 Data Size: 4 digits Digit / Description / Default / Unmapped IO Status 0 / Reset multi-turn data of Absolute Encoder(R-ABS) / 0x0 / OFF 1 / Gain Bank Select(BANK-SEL) / 0x0 / OFF 2 / Analog Current Limit(A-CL) / 0x0 / OFF 3 / Absolute Position Transfer Mode(ABS-MD) / 0x0 / OFF Applicable Operating Mode: All When Enabled: Servo-Off -> Setting Please refer to the above content.	[Ft-0.15]-Digit2
	Current Limit-Analog	Analog Current Limit(A-CL) Note: This parameter is only added for CSD5 Drive	[Ft-0.15]-Digit3
Default:	Unassigned		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		
Drive - Digital Inputs- Input 10			
Description	Select the drive's digital input assignments.		
Parameter	[Ft-0.22]~ [Ft-0.27]		
Range:	Select:	Description	Value
	Unassigned	Unassigned	
	Alternate Gain Select	Alternate Gain Select(G-SEL)	[Ft-0.13]-Digit2
	Current Limit - Positive	Positive Current Limit(P-TL)	[Ft-0.11]-Digit2
	Current Limit - Negative	Negative Current Limit(N-TL)	[Ft-0.11]-Digit1
	Drive Enable	Drive Enable(SV-ON)	[Ft-0.10]-Digit0

	Fault Reset	Fault Reset(A-RST)	[Ft-0.11]-Digit0
	Integrator Inhibit	Integrator Inhibit(P-CON)	[Ft-0.10]-Digit3
	Operation Mode Override	Operation Mode Override(C-SEL)	[Ft-0.11]-Digit3
	Overtravel - Negative	Negative Over-travel(N-OT)	[Ft-0.10]-Digit2
	Overtravel - Positive	Positive Over-travel(P-OT)	[Ft-0.10]-Digit1
	Pause Follower	Pause Follower(INHIBIT)	[Ft-0.13]-Digit1
	Position Strobe	Position Strobe(ABS-DT)	[Ft-0.14]-Digit0
	Velocity Direction	Preset Direction(C-DIR)	[Ft-0.12]-Digit0
	Preset Select 1	Preset Select 1(C-SP1)	[Ft-0.12]-Digit1
	Preset Select 2	Preset Select 2(C-SP2)	[Ft-0.12]-Digit2
	Preset Select 3	Preset Select 3(C-SP3)	[Ft-0.12]-Digit3
	Reset Multiturn Data	Reset multi-turn data of Absolute Encoder(R-ABS)	[Ft-0.15]-Digit0
	Zero Speed Clamp Enable	Zero Speed Clamp Enable(Z-CLP)	[Ft-0.13]-Digit0
	Position Clear	Position clear(PCLR)	[Ft-0.13]-Digit3
	Moving Enable	Motor Moving Enable (START).	[Ft-0.14]-Digit1
	Analog Speed Command Enable	Analog Speed Command Select (C-SP4)	[Ft-0.14]-Digit2
	2nd Electronic Gear Bank Selection	2nd Electronic Gear Bank Selection(GEAR)	[Ft-0.14]-Digit3
	Home Sensor	Home Sensor(H-SENS)	[Ft-0.16]-Digit0
	Start Homing	Start Homing(SHOME)	[Ft-0.16]-Digit1
	Stop Indexing	Stop Indexing(STOP)	[Ft-0.16]-Digit2
	Pause Indexing	Pause Indexing(PAUSE)	[Ft-0.16]-Digit3
	Index Select0 Input	Index Select 0 Input(I-SEL0)	[Ft-0.17]-Digit0
	Index Select1 Input	Index Select 1 Input(I-SEL1)	[Ft-0.17]-Digit1
	Index Select2 Input	Index Select 2 Input(I-SEL2)	[Ft-0.17]-Digit2
	Index Select3 Input	Index Select 3 Input(I-SEL3)	[Ft-0.17]-Digit3
	Index Select4 Input	Index Select 4 Input(I-SEL4)	[Ft-0.18]-Digit0
	Index Select5 Input	Index Select 5 Input(I-SEL5)	[Ft-0.18]-Digit1
	Stop Homing	Stop Homing(H-STOP)	[Ft-0.18]-Digit2
	Start Indexing	Start Index(START-I)	[Ft-0.18]-Digit3
	Current Limit-Analog	Analog Current Limit(A-CL)	[Ft-0.15]-Digit1
	Absolute Position Transfer Mode	Absolute Position Transfer Mode(ABS-MD) [Pr – 0.15] / Allocation of Input Signals 6 Data Size: 4 digits Digit / Description / Default / Unmapped IO Status 0 / Reset multi-turn data of Absolute Encoder(R-ABS) / 0x0 / OFF 1 / Gain Bank Select(BANK-SEL) / 0x0 / OFF 2 / Analog Current Limit(A-CL) / 0x0 / OFF 3 / Absolute Position Transfer Mode(ABS-MD) / 0x0 / OFF Applicable Operating Mode: All When Enabled: Servo-Off -> Setting Please refer to the above content.	[Ft-0.15]-Digit2
	Current Limit-Analog	Analog Current Limit(A-CL) Note: This parameter is only added for CSD5 Drive	[Ft-0.15]-Digit3
Default:	Unassigned		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		

The following statuses are displayed by default for a CSD5 drive in the Digital Inputs window:

Status	Description
Input 1~10 State	The current state, or condition, of each digital input is depicted by a light bulb icon, as follows: ON- a bright light bulb OFF- a darkened light bulb.

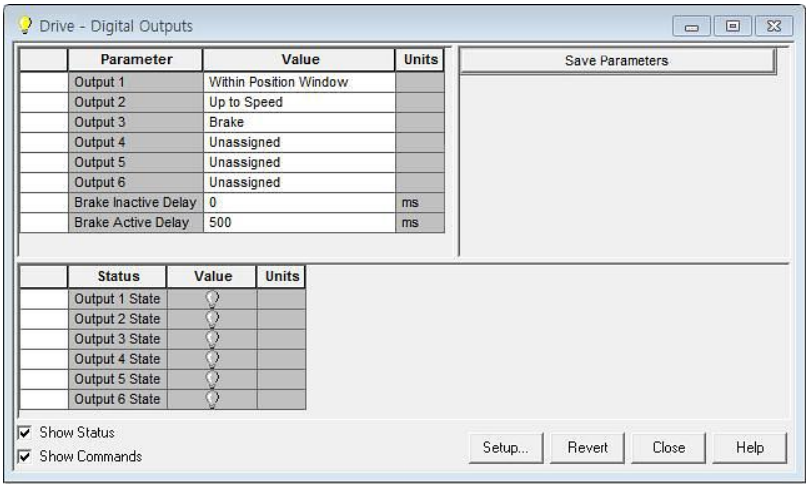
No Special commands are associated with the Digital Inputs window.

Customize the Digital Inputs window for your CSD5 Drive branch by selecting one or more of the following buttons:

- Toggle the **Show Status** selection to display or hide the Status pane.
- Toggle the **Show Commands** selection to display or hide the Commands pane.
- Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Understanding the Digital Outputs Window

The Properties window for Digital Outputs looks like this



Use the Digital Outputs window to:

- assign functionality to digital outputs,
- set both active and inactive brake delays,
- monitor the status of digital outputs.

The following parameters are associated with this window:

Drive – Digital Outputs	
Drive - Digital Outputs- Output 1	
Description	Select the functionality to be assigned to digital output 1
Parameter	[Ft-0.22]~ [Ft-0.27]

Range:	Select:	Description	Value
	Unassigned	Unassigned	
	Within position window	Within position window (P-COM): An active output state indicates that the position error has been less than the Position Functions: In Position Size setting for longer than the Position Functions: In Position Time setting in the CSD5 Drive window.	[Ft-0.22]-Digit0
	Up to speed	Up to speed (TG-ON): An active output state indicates motor velocity feedback is greater than the Up to Speed setting in the CSD5 Drive window.	[Ft-0.22]-Digit1
	Brake	Brake control (BK): Used to control a motor brake. An active state releases the motor brake. The Brake signal is the same as the Drive Enabled signal, with the addition of the turn-on and turn-off delays specified by the Brake Active Delay and Brake Inactive Delay.	[Ft-0.22]-Digit2
	Within Speed window	Within Speed window (V-COM): An active output state indicates that the velocity error is less than the In Speed Window setting in the CSD5 drive window.	[Ft-0.22]-Digit3
	Current Limited	Current Limited (T-LMT): An active state indicates the drive's current is being limited as set in the Drive window.	[Ft-0.23]-Digit0
	Velocity Limited	Velocity Limited (V-LMT)): An active state indicates the drive's velocity is being limited as set in the Drive window.	[Ft-0.23]-Digit1
	With Near Window	Near position(NEAR)	[Ft-0.23]-Digit2
	Warning	Warning(WARN)	[Ft-0.23]-Digit3
	Absolute position valid	Absolute position valid(A-VLD)	[Ft-0.24]-Digit0
	Ready	Servo drive ready: An active state indicates the drive is operational and does not have a fault.	[Ft-0.24]-Digit1
	In Motion	In Motion (IMO): An active state indicates an index move is active and the motor is moving.	[Ft-0.25]-Digit0
	I Dwell	In Dwell (I-DW): An active state indicates the motor is holding position in an index move and waiting for the commanded dwell time.	[Ft-0.25]-Digit1
	Axis Homed	Axis Homed (HOMC): An active state indicates that the homing routine has completed.	[Ft-0.25]-Digit2
	Index Select 0 Output	Index Select 0 Out(O-ISEL0)	[Ft-0.25]-Digit3
	Index Select 1 Output	Index Select 1 Out(O-ISEL1)	[Ft-0.26]-Digit0
	Index Select 2 Output	Index Select 2 Out(O-ISEL2)	[Ft-0.26]-Digit1
	Index Select 3 Output	Index Select 3 Out(O-ISEL3)	[Ft-0.26]-Digit2
	Index Select 4 Output	Index Select 4 Out(O-ISEL4)	[Ft-0.26]-Digit3
	Index Select 5 Output Moving Enable	Index Select 5 Out(O-ISEL5)	[Ft-0.27]-Digit0
	End of Sequence	End of Sequence (E-SEQU): An active state indicates all iterations of the index move have been completed. Note: This parameter is only added for CSD5 Drive.	[Ft-0.27]-Digit1
Default:	Within Position Window		

Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting-		
Drive - Digital Outputs- Output 2			
Description	Select the functionality to be assigned to digital output 2		
Parameter	[Ft-0.22]~ [Ft-0.27]		
Range:	Select:	Description	Value
	Unassigned	Unassigned	
	Within position window	Within position window (P-COM): An active output state indicates that the position error has been less than the Position Functions: In Position Size setting for longer than the Position Functions: In Position Time setting in the CSD5 Drive window.	[Ft-0.22]-Digit0
	Up to speed	Up to speed (TG-ON): An active output state indicates motor velocity feedback is greater than the Up to Speed setting in the CSD5 Drive window.	[Ft-0.22]-Digit1
	Brake	Brake control (BK): Used to control a motor brake. An active state releases the motor brake. The Brake signal is the same as the Drive Enabled signal, with the addition of the turn-on and turn-off delays specified by the Brake Active Delay and Brake Inactive Delay.	[Ft-0.22]-Digit2
	Within Speed window	Within Speed window(V-COM): An active output state indicates that the velocity error is less than the In Speed Window setting in the CSD5 drive window.	[Ft-0.22]-Digit3
	Current Limited	Current Limited (T-LMT): An active state indicates the drive's current is being limited as set in the Drive window.	[Ft-0.23]-Digit0
	Velocity Limited	Velocity Limited (V-LMT)): An active state indicates the drive's velocity is being limited as set in the Drive window.	[Ft-0.23]-Digit1
	With Near Window	Near position(NEAR)	[Ft-0.23]-Digit2
	Warning	Warning(WARN)	[Ft-0.23]-Digit3
	Absolute position valid	Absolute position valid(A-VLD)	[Ft-0.24]-Digit0
	Ready	Servo drive ready: An active state indicates the drive is operational and does not have a fault.	[Ft-0.24]-Digit1
	In Motion	In Motion (IMO): An active state indicates an index move is active and the motor is moving.	[Ft-0.25]-Digit0
	I Dwell	In Dwell (I-DW): An active state indicates the motor is holding position in an index move and waiting for the commanded dwell time.	[Ft-0.25]-Digit1
	Axis Homed	Axis Homed (HOMC): An active state indicates that the homing routine has completed.	[Ft-0.25]-Digit2
	Index Select 0 Output	Index Select 0 Out(O-ISEL0)	[Ft-0.25]-Digit3
	Index Select 1 Output	Index Select 1 Out(O-ISEL1)	[Ft-0.26]-Digit0
	Index Select 2 Output	Index Select 2 Out(O-ISEL2)	[Ft-0.26]-Digit1
	Index Select 3 Output	Index Select 3 Out(O-ISEL3)	[Ft-0.26]-Digit2
	Index Select 4 Output	Index Select 4 Out(O-ISEL4)	[Ft-0.26]-Digit3

	Index Select 5 Output Moving Enable	Index Select 5 Out(O-ISEL5)	[Ft-0.27]-Digit0
	End of Sequence	End of Sequence (E-SEQU): An active state indicates all iterations of the index move have been completed. Note: This parameter is only added for CSD5 Drive.	[Ft-0.27]-Digit1
Default:	Up to speed		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting-		
Drive - Digital Outputs- Output 3			
Description	Select the functionality to be assigned to digital output 3		
Parameter	[Ft-0.22]~ [Ft-0.27]		
Range:	Select:	Description	Value
	Unassigned	Unassigned	
	Within position window	Within position window (P-COM): An active output state indicates that the position error has been less than the Position Functions: In Position Size setting for longer than the Position Functions: In Position Time setting in the CSD5 Drive window.	[Ft-0.22]-Digit0
	Up to speed	Up to speed (TG-ON): An active output state indicates motor velocity feedback is greater than the Up to Speed setting in the CSD5 Drive window.	[Ft-0.22]-Digit1
	Brake	Brake control (BK): Used to control a motor brake. An active state releases the motor brake. The Brake signal is the same as the Drive Enabled signal, with the addition of the turn-on and turn-off delays specified by the Brake Active Delay and Brake Inactive Delay.	[Ft-0.22]-Digit2
	Within Speed window	Within Speed window (V-COM): An active output state indicates that the velocity error is less than the In Speed Window setting in the CSD5 drive window.	[Ft-0.22]-Digit3
	Current Limited	Current Limited (T-LMT): An active state indicates the drive's current is being limited as set in the Drive window.	[Ft-0.23]-Digit0
	Velocity Limited	Velocity Limited (V-LMT)): An active state indicates the drive's velocity is being limited as set in the Drive window.	[Ft-0.23]-Digit1
	With Near Window	Near position(NEAR)	[Ft-0.23]-Digit2
	Warning	Warning(WARN)	[Ft-0.23]-Digit3
	Absolute position valid	Absolute position valid(A-VLD)	[Ft-0.24]-Digit0
	Ready	Servo drive ready: An active state indicates the drive is operational and does not have a fault.	[Ft-0.24]-Digit1
	In Motion	In Motion (IMO): An active state indicates an index move is active and the motor is moving.	[Ft-0.25]-Digit0
	I Dwell	In Dwell (I-DW): An active state indicates the motor is holding position in an index move and waiting for the commanded dwell time.	[Ft-0.25]-Digit1
	Axis Homed	Axis Homed (HOMC): An active state indicates that the homing routine has completed.	[Ft-0.25]-Digit2
	Index Select 0 Output	Index Select 0 Out(O-ISEL0)	[Ft-0.25]-Digit3

	Index Select 1 Output	Index Select 1 Out(O-ISEL1)	[Ft-0.26]-Digit0
	Index Select 2 Output	Index Select 2 Out(O-ISEL2)	[Ft-0.26]-Digit1
	Index Select 3 Output	Index Select 3 Out(O-ISEL3)	[Ft-0.26]-Digit2
	Index Select 4 Output	Index Select 4 Out(O-ISEL4)	[Ft-0.26]-Digit3
	Index Select 5 Output Moving Enable	Index Select 5 Out(O-ISEL5)	[Ft-0.27]-Digit0
	End of Sequence	End of Sequence (E-SEQU): An active state indicates all iterations of the index move have been completed. Note: This parameter is only added for CSD5 Drive.	[Ft-0.27]-Digit1
Default:	Brake		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting-		
Drive - Digital Outputs- Output 4			
Description	Select the functionality to be assigned to digital output 4		
Parameter	[Ft-0.22]~ [Ft-0.27]		
Range:	Select:	Description	Value
	Unassigned	Unassigned	
	Within position window	Within position window (P-COM): An active output state indicates that the position error has been less than the Position Functions: In Position Size setting for longer than the Position Functions: In Position Time setting in the CSD5 Drive window.	[Ft-0.22]-Digit0
	Up to speed	Up to speed (TG-ON): An active output state indicates motor velocity feedback is greater than the Up to Speed setting in the CSD5 Drive window.	[Ft-0.22]-Digit1
	Brake	Brake control (BK): Used to control a motor brake. An active state releases the motor brake. The Brake signal is the same as the Drive Enabled signal, with the addition of the turn-on and turn-off delays specified by the Brake Active Delay and Brake Inactive Delay.	[Ft-0.22]-Digit2
	Within Speed window	Within Speed window (V-COM): An active output state indicates that the velocity error is less than the In Speed Window setting in the CSD5 drive window.	[Ft-0.22]-Digit3
	Current Limited	Current Limited (T-LMT): An active state indicates the drive's current is being limited as set in the Drive window.	[Ft-0.23]-Digit0
	Velocity Limited	Velocity Limited (V-LMT): An active state indicates the drive's velocity is being limited as set in the Drive window.	[Ft-0.23]-Digit1
	With Near Window	Near position(NEAR)	[Ft-0.23]-Digit2
	Warning	Warning(WARN)	[Ft-0.23]-Digit3
	Absolute position valid	Absolute position valid(A-VLD)	[Ft-0.24]-Digit0
	Ready	Servo drive ready: An active state indicates the drive is operational and does not have a fault.	[Ft-0.24]-Digit1

	In Motion	In Motion (IMO): An active state indicates an index move is active and the motor is moving.	[Ft-0.25]-Digit0
	I Dwell	In Dwell (I-DW): An active state indicates the motor is holding position in an index move and waiting for the commanded dwell time.	[Ft-0.25]-Digit1
	Axis Homed	Axis Homed (HOMC): An active state indicates that the homing routine has completed.	[Ft-0.25]-Digit2
	Index Select 0 Output	Index Select 0 Out(O-ISEL0)	[Ft-0.25]-Digit3
	Index Select 1 Output	Index Select 1 Out(O-ISEL1)	[Ft-0.26]-Digit0
	Index Select 2 Output	Index Select 2 Out(O-ISEL2)	[Ft-0.26]-Digit1
	Index Select 3 Output	Index Select 3 Out(O-ISEL3)	[Ft-0.26]-Digit2
	Index Select 4 Output	Index Select 4 Out(O-ISEL4)	[Ft-0.26]-Digit3
	Index Select 5 Output Moving Enable	Index Select 5 Out(O-ISEL5)	[Ft-0.27]-Digit0
	End of Sequence	End of Sequence (E-SEQU): An active state indicates all iterations of the index move have been completed. Note: This parameter is only added for CSD5 Drive.	[Ft-0.27]-Digit1
Default:	Unassigned		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting-		
Drive - Digital Outputs- Output 5			
Description	Select the functionality to be assigned to digital output 5		
Parameter	[Ft-0.22]~ [Ft-0.27]		
Range:	Select:	Description	Value
	Unassigned	Unassigned	
	Within position window	Within position window (P-COM): An active output state indicates that the position error has been less than the Position Functions: In Position Size setting for longer than the Position Functions: In Position Time setting in the CSD5 Drive window.	[Ft-0.22]-Digit0
	Up to speed	Up to speed (TG-ON): An active output state indicates motor velocity feedback is greater than the Up to Speed setting in the CSD5 Drive window.	[Ft-0.22]-Digit1
	Brake	Brake control (BK): Used to control a motor brake. An active state releases the motor brake. The Brake signal is the same as the Drive Enabled signal, with the addition of the turn-on and turn-off delays specified by the Brake Active Delay and Brake Inactive Delay.	[Ft-0.22]-Digit2
	Within Speed window	Within Speed window (V-COM): An active output state indicates that the velocity error is less than the In Speed Window setting in the CSD5 drive window.	[Ft-0.22]-Digit3
	Current Limited	Current Limited (T-LMT): An active state indicates the drive's current is being limited as set in the Drive window.	[Ft-0.23]-Digit0

	Velocity Limited	Velocity Limited (V-LMT)): An active state indicates the drive's velocity is being limited as set in the Drive window.	[Ft-0.23]-Digit1
	With Near Window	Near position(NEAR)	[Ft-0.23]-Digit2
	Warning	Warning(WARN)	[Ft-0.23]-Digit3
	Absolute position valid	Absolute position valid(A-VLD)	[Ft-0.24]-Digit0
	Ready	Servo drive ready: An active state indicates the drive is operational and does not have a fault.	[Ft-0.24]-Digit1
	In Motion	In Motion (IMO): An active state indicates an index move is active and the motor is moving.	[Ft-0.25]-Digit0
	I Dwell	In Dwell (I-DW): An active state indicates the motor is holding position in an index move and waiting for the commanded dwell time.	[Ft-0.25]-Digit1
	Axis Homed	Axis Homed (HOMC): An active state indicates that the homing routine has completed.	[Ft-0.25]-Digit2
	Index Select 0 Output	Index Select 0 Out(O-ISEL0)	[Ft-0.25]-Digit3
	Index Select 1 Output	Index Select 1 Out(O-ISEL1)	[Ft-0.26]-Digit0
	Index Select 2 Output	Index Select 2 Out(O-ISEL2)	[Ft-0.26]-Digit1
	Index Select 3 Output	Index Select 3 Out(O-ISEL3)	[Ft-0.26]-Digit2
	Index Select 4 Output	Index Select 4 Out(O-ISEL4)	[Ft-0.26]-Digit3
	Index Select 5 Output Moving Enable	Index Select 5 Out(O-ISEL5)	[Ft-0.27]-Digit0
	End of Sequence	End of Sequence (E-SEQU): An active state indicates all iterations of the index move have been completed. Note: This parameter is only added for CSD5 Drive.	[Ft-0.27]-Digit1
Default:	Unassigned		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting-		
Drive - Digital Outputs- Output 6			
Description	Select the functionality to be assigned to digital output 6		
Parameter	[Ft-0.22]~ [Ft-0.27]		
Range:	Select:	Description	Value
	Unassigned	Unassigned	
	Within position window	Within position window (P-COM): An active output state indicates that the position error has been less than the Position Functions: In Position Size setting for longer than the Position Functions: In Position Time setting in the CSD5 Drive window.	[Ft-0.22]-Digit0
	Up to speed	Up to speed (TG-ON): An active output state indicates motor velocity feedback is greater than the Up to Speed setting in the CSD5 Drive window.	[Ft-0.22]-Digit1

	Brake	Brake control (BK): Used to control a motor brake. An active state releases the motor brake. The Brake signal is the same as the Drive Enabled signal, with the addition of the turn-on and turn-off delays specified by the Brake Active Delay and Brake Inactive Delay.	[Ft-0.22]-Digit2
	Within Speed window	Within Speed window (V-COM): An active output state indicates that the velocity error is less than the In Speed Window setting in the CSD5 drive window.	[Ft-0.22]-Digit3
	Current Limited	Current Limited (T-LMT): An active state indicates the drive's current is being limited as set in the Drive window.	[Ft-0.23]-Digit0
	Velocity Limited	Velocity Limited (V-LMT): An active state indicates the drive's velocity is being limited as set in the Drive window.	[Ft-0.23]-Digit1
	With Near Window	Near position(NEAR)	[Ft-0.23]-Digit2
	Warning	Warning(WARN)	[Ft-0.23]-Digit3
	Absolute position valid	Absolute position valid(A-VLD)	[Ft-0.24]-Digit0
	Ready	Servo drive ready: An active state indicates the drive is operational and does not have a fault.	[Ft-0.24]-Digit1
	In Motion	In Motion (IMO): An active state indicates an index move is active and the motor is moving.	[Ft-0.25]-Digit0
	I Dwell	In Dwell (I-DW): An active state indicates the motor is holding position in an index move and waiting for the commanded dwell time.	[Ft-0.25]-Digit1
	Axis Homed	Axis Homed (HOMC): An active state indicates that the homing routine has completed.	[Ft-0.25]-Digit2
	Index Select 0 Output	Index Select 0 Out(O-ISEL0)	[Ft-0.25]-Digit3
	Index Select 1 Output	Index Select 1 Out(O-ISEL1)	[Ft-0.26]-Digit0
	Index Select 2 Output	Index Select 2 Out(O-ISEL2)	[Ft-0.26]-Digit1
	Index Select 3 Output	Index Select 3 Out(O-ISEL3)	[Ft-0.26]-Digit2
	Index Select 4 Output	Index Select 4 Out(O-ISEL4)	[Ft-0.26]-Digit3
	Index Select 5 Output Moving Enable	Index Select 5 Out(O-ISEL5)	[Ft-0.27]-Digit0
	End of Sequence	End of Sequence (E-SEQU): An active state indicates all iterations of the index move have been completed. Note: This parameter is only added for CSD5 Drive.	[Ft-0.27]-Digit1
Default:	Unassigned		
Applicable Operating Mode:	All		
When Enabled	Servo-Off -> Setting		
Drive - Digital Outputs- Brake Inactive Delay			
Description	The time delay between disabling the drive and deactivating the Brake output, which applies the motor brake.		
Parameter	[Ft-5.06]		
Range:	0~10000		
Default:	0		

Units:	ms
Applicable Operating Mode:	All
When Enabled	Servo-Off -> Setting
Drive - Digital Outputs- Brake Active Delay	
Description	The time delay between enabling the drive and activating the Brake output, which releases the motor brake.
Parameter	[Ft-5.08]
Range:	0~10000
Default:	500
Units:	ms
Applicable Operating Mode:	All
When Enabled	Servo-Off -> Setting

The following statuses are displayed by default for an CSD5 Drive in the Digital Outputs window:

Status	Description
Output 1~6 State	The current state, or condition, of each digital output is depicted by a light bulb icon, as follows: ON - a bright light bulb OFF - a darkened light bulb.

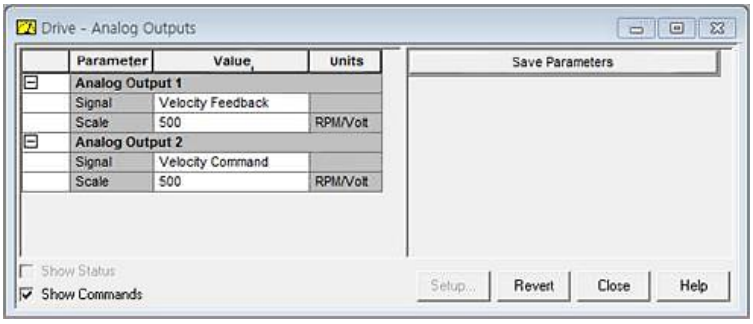
No Special commands are associated with the Digital Outputs window.

Customize the Digital Outputs window for your CSD5 Drive branch by selecting one or more of the following buttons:

- Toggle the **Show Status** selection to display or hide the Status pane.
- Toggle the **Show Commands** selection to display or hide the Commands pane.
- Click on the **Setup** button to open the Monitor Setup window as shown on page 112, where you can customize the status display for this window.
- Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Understanding the Analog Outputs Window

The Properties window for Analog Outputs looks like this:



Use the Analog Outputs window to assign drive signals to analog outputs.

The Analog Outputs parameters window has the following parameters:

Drive – Analog Outputs			
Drive - Analog Outputs - Analog Output 1,2			
Drive - Analog Outputs - Analog Output 1,2 - Signal			
Description	The drive signal assigned to channel 1 from the Channel Setup dialog box in the Oscilloscope window.		
Parameter	[Ft-5.13], [Ft-5.14]		
Range:	Select	Description	Value
	Motor Feedback Position	Motor Feedback Position	1~99999[count/V]
	Master Position	Master Position	1~99999[count/V]
	Follower Position	Follower Position	1~99999[count/V]
	Position Error	Position Error	1~99999[count/V]
	Position Command Count Frequency	Position Command Count Frequency	0.1~9999.9[kilocount/V]
	Velocity Command	Velocity Command	1~99999[RPM/V]
	Velocity Feedback	Velocity Feedback	1~99999[RPM/V]
	Velocity Error	Velocity Error	1~99999[RPM/V]
	Current Command	Current Command	changeable with motor type[%/V]
	Current Feedback	Current Feedback	changeable with motor type[%/V]
	U Phase Current	U Phase Current	changeable with motor type[%/V]
	V Phase Current	V Phase Current	changeable with motor type[%/V]
	W Phase Current	W Phase Current	changeable with motor type[%/V]
	Commutation Angle	Commutation Angle	0.1~9999.9[°/V]
	Mechanical Angle	Mechanical Angle	0.1~9999.9[°/V]
	Shunt Power Limit Ratio	Shunt Power Limit Ratio	1~99999[%/V]
	Instantaneous Shunt Power	Instantaneous Shunt Power	1~99999[W/V]
	Drive Utilization	Drive Utilization	1~99999[%/V]
	Absolute Rotations	Absolute Rotations	1~99999[revolution/V]
	Bus Voltage	Bus Voltage	1~99999[V/V]
	Velocity Command Offset	Velocity Command Offset	0.1~9999.9[mV/V]
	Current Command Offset	Current Command Offset	0.1~9999.9[mV/V]
	Motor Utilization	Motor Utilization	1~99999[%/V]
	Analog Command - Velocity	Analog Command - Velocity	0.01~999.99[V/V]
	Analog Command - Current	Analog Command - Current	0.01~999.99[V/V]
Default:	Velocity Feedback		
Applicable Operating Mode:	All		
When Enabled	Immediately		
Drive - Analog Outputs - Analog Output 1,2 - Scale			
Description	The amplitude of the channel 1 input signal to be displayed by the oscilloscope.		

Parameter	[Ft-5.15], [Ft-5.16]
Range:	1 ~ 99999
Default:	500
Units:	Units depend on the channel selection.
Applicable Operating Mode:	All
When Enabled	Immediately

No status is displayed for an CSD5 drive in the Analog Outputs window. No Special commands are associated with the Analog Outputs window.

Customize the Analog Outputs window for your CSD5 Drive branch by selecting one or more of the following buttons:

- Toggle the **Show Status** selection to display or hide the Status pane.
- Toggle the **Show Commands** selection to display or hide the Commands pane.
- Click on the **Setup** button to open the Monitor Setup window as shown on page 112, where you can customize the status display for this window.
- Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Understanding the Monitor

RSWare's Monitor tool lets you select and display all or any combination of drive statuses for a selected CSD5 on-line drive. The Monitor tool works just like the status pane of a branch's Properties window.

Use this window to:

- View a collection of statuses.
- Open the Monitor Setup window, where you can select the collection of statuses to display in this window.
- Load a monitor previously saved.
- Save a monitor for later use.

This window has the following commands:

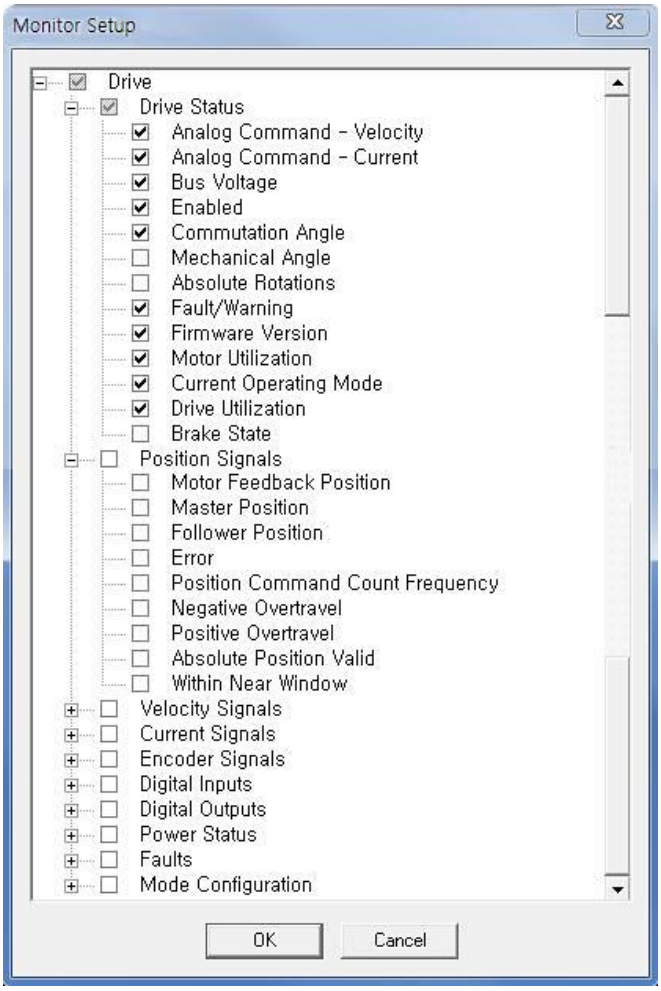
Commands	Description
Format	Select the format for displaying integer values in the monitor: •**Decimal**(Range: 0 to 2147483647) •**Hexadecimal**, or •**Binary** Note: Do not create negative numbers in the Hexadecimal or Binary format.
Load	Opens the Monitor Load dialog, where you can: •**Load** a previously saved monitor from the list. •**Delete** an existing monitor from the list. •**Save as de fault** an existing monitor to automatically load each time you open the Monitor window.
Save	Opens the Monitor Save dialog, where you can: •**Save** a monitor, under a new or existing name, for later use. •**Delete** an existing monitor from the list. •**Save as de fault** an existing monitor to automatically load each time you open the Monitor window.
Setup	Opens the Monitor Setup window, where you can select the drive statuses that is displayed in this window.

To monitor your drives:

1. Double-click the left mouse button on the Monitor icon in the Workspace window. The Monitor window appears in the Client Area.
2. Click the **Setup…** button to open the Monitor Setup window, where you can customize the display of the Monitor window for the selected on-line CSD5 drive. The window displays a tree diagram with all the statuses that can be monitored for the selected drive.
3. Place a check mark in the checkbox to the left of a status item to monitor it. Note:

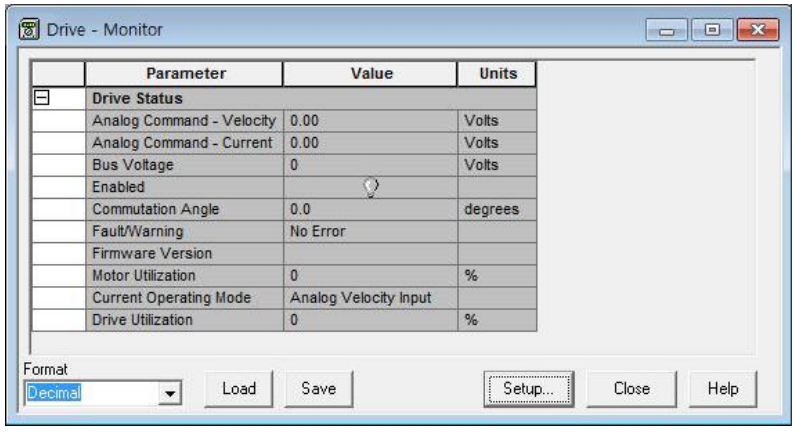
   - If you place a check mark beside a parent item, all its child items become checked and their statuses are displayed.
   - If you remove a check mark from a parent item, check marks are removed from all its child items and their statuses are not displayed
   - If you place a check mark next to some - but not all – child items, the parent item is checked, but grayed.

Note: The Properties window for Motor Setup of KNX3 and CSD5 are different. The below is an illustration of CSD5 Drive.



4. After you have finished selecting the statuses you wish to monitor, select **OK to** close the Monitor Setup window

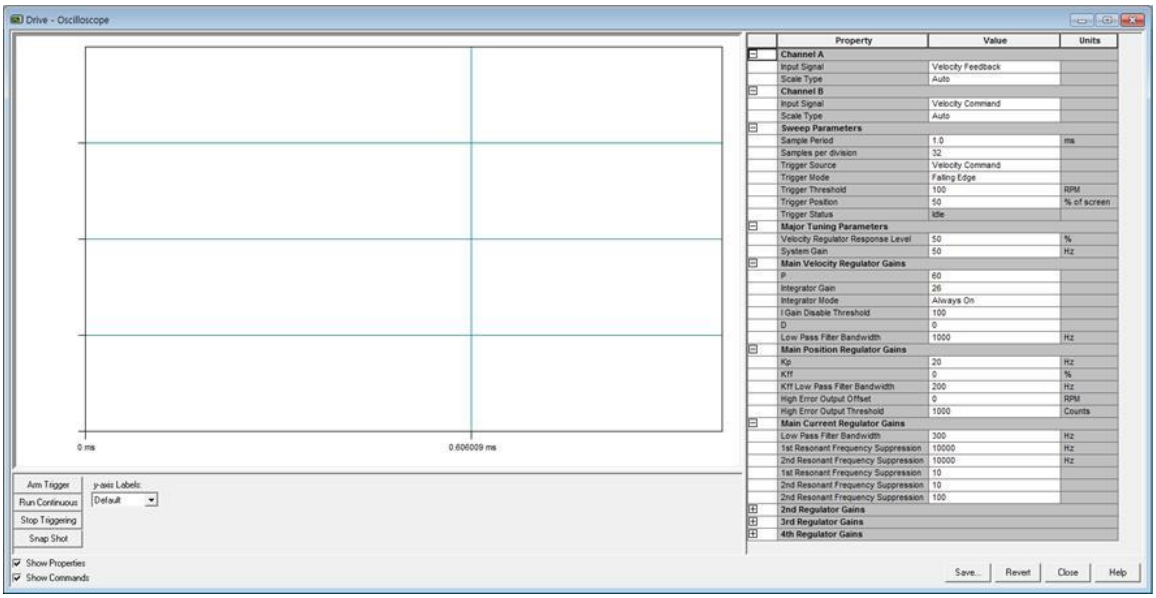
5. The Monitor window now displays all the selected statuses:



Understanding the Oscilloscope Window

The Properties window for the Oscilloscope looks like this

Note: The Properties window for the Oscilloscope of CSD5 Drive and KNX3 Drive are not same. The below is an illustration of CSD5 Drive.



Use the Oscilloscope window to trace one of two drive signals by:

- Configuring the oscilloscope by selecting a drive signal to trace.
- Executing commands that run the oscilloscope's tracing function continuously or in response to the configured trigger.
- Monitoring the oscilloscope as it traces the selected drive signal.

The Oscilloscope window has the following parameters and commands associated with it:

Drive – Oscilloscope			
Drive – Oscilloscope – Channel A,B			
Drive - Oscilloscope – Channel A,B – Input Signal			
Description	Signal Select a drive signal to assign to the selected Channel (A,B) from the Channel Setup dialog box that opens when you click on the down arrow to the right of this input box. Note: The resolution of this signal may be confusing if Velocity Feedback is selected. See the topic Velocity Motor Feedback Resolution for information on how is derived for various motor and feedback combinations.		
Parameter	-		
Range:	Select	Description	Value
	Motor Feedback Position	Motor Feedback Position	1~99999[count/V]
	Master Position	Master Position	1~99999[count/V]
	Follower Position	Follower Position	1~99999[count/V]
	Position Error	Position Error	1~99999[count/V]
	Position Command Count Frequency	Position Command Count Frequency	0.1~9999.9[kilocount/V]
	Velocity Command	Velocity Command	1~99999[RPM/V]
	Velocity Feedback	Velocity Feedback	1~99999[RPM/V]
	Velocity Error	Velocity Error	1~99999[RPM/V]
	Current Command	Current Command	changeable with motor type[%/V]
	Current Feedback	Current Feedback	changeable with motor type[%/V]

	U Phase Current	U Phase Current	changeable with motor type[%/V]	
	V Phase Current	V Phase Current	changeable with motor type[%/V]	
	W Phase Current	W Phase Current	changeable with motor type[%/V]	
	Commutation Angle	Commutation Angle	0.1~9999.9[°/V]	
	Mechanical Angle	Mechanical Angle	0.1~9999.9[°/V]	
	Shunt Power Limit Ratio	Shunt Power Limit Ratio	1~99999[%/V]	
	Instantaneous Shunt Power	Instantaneous Shunt Power	1~99999[W/V]	
	Drive Utilization	Drive Utilization	1~99999[%/V]	
	Absolute Rotations	Absolute Rotations	1~99999[revolution/V]	
	Bus Voltage	Bus Voltage	1~99999[V/V]	
	Velocity Command Offset	Velocity Command Offset	0.1~9999.9[mV/V]	
	Current Command Offset	Current Command Offset	0.1~9999.9[mV/V]	
	Motor Utilization	Motor Utilization	1~99999[%/V]	
	Analog Command - Velocity	Analog Command - Velocity	0.01~999.99[V/V]	
	Analog Command - Current	Analog Command - Current	0.01~999.99[V/V]	
	Digital I/O	Digital I/O	bit 0	Digital Input 1
			bit 1	Digital Input 2
			bit 2	Digital Input 3
			bit 3	Digital Input 4
			bit 4	Digital Input 5
			bit 5	Digital Input 6
			bit 6	Digital Input 7
			bit 7	Digital Input 8
			bit 8	Digital Input 9
			bit 9	Digital Input 10
			bit 10	Estop
			bit 11	Digital Output 1
			bit 12	Digital Output 2
			bit 13	Digital Output 3
			bit 14	Fault
			bit 15	Digital Output 4 / Fault 1
			bit 16	Digital Output 5 / Fault 2
			bit 17	Digital Output 6 / Fault 3
Default:	Velocity Feedback			
Applicable Operating Mode:	All			
When Enabled	Immediately			
Drive - Oscilloscope – Channel A,B– Scale Type				
Description	Select the division scale and offset setting			
Parameter	-			
Range:	Select	Description	Value	
	Auto	The division scale and offset are changed automatically	-	
	Manual	The division scale and offset are set manually	-	
Default:	Auto			

Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Oscilloscope – Channel A,B– Scale	
Description	The amplitude of the selected channel input signal that can be displayed between gridlines of the oscilloscope, in the units of the drive signal. It is dependent on the signal selected. If the Scale is left at its default value of 0, RSWare auto scales the data to fit the graph. Note: Visible only if Scale Type is Manual.
Parameter	[Ft-5.13], [Ft-5.14]
Range:	1 ~ 99999
Default:	0
Units:	Units depend on the channel selection.
Applicable Operating Mode:	All
When Enabled	Immediately
Drive - Oscilloscope – Channel A,B– Offset	
Description	The trace offset for the selected Channel Input. Its range depends on the signal selected. A value of zero places the zero value of the signal at the middle grid line. A nonzero offset shifts the trace up or down so that the offset value is positioned at the middle grid line. Note: Visible only if Scale Type is Manual.
Parameter	[Ft-5.15], [Ft-5.16]
Range:	1~99999
Default:	0
Units:	Units depend on the channel selection.
Applicable Operating Mode:	All
When Enabled	Immediately

Y-axis Labels	Labels Select which labels to display on the y-axis: •Default: One reference point for each channel is displayed. •Channel A •Channel B
Legend	The legend displays the color of the trace for each displayed input signal. The colors can be modified by clicking on the color rectangles displayed in the legend

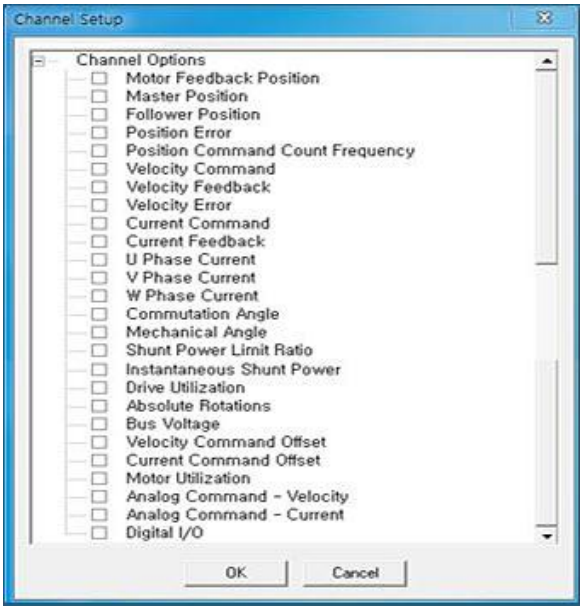
The following commands can be executed for the Oscilloscope window of an on-line drive:

Command	Description
Arm Trigger	Turns the oscilloscope trigger ON.
Run Continuous	Runs the oscilloscope continuously, circumventing the trigger
Stop Triggering	Turns the oscilloscope trigger OFF.
Snap Shot	Show the a set of data in Snap Shot Dialog

Customize the Oscilloscope window for your CSD5 Drive branch by selecting one or more of the following buttons:

- Toggle the **Show Properties** selection to display or hide the Properties pane.
- Toggle the **Show Commands** selection to display or hide the Commands pane.
- Click on the **Save** button to save the oscilloscope data to a tab delimited file on your PC, which can be read by spreadsheet or presentation software. Information saved includes the Oscilloscope data points from one or more channels.
- Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Channel Setup Window



Note: Digital I/O option is added only for CSD5.

Use this window to:

- Assign a specific Input Signal to the selected Channel in the Oscilloscope window for an CSD5 drive, or
- Assign no Input Signal to the selected channel in the Oscilloscope window for an CSD5 drive.

Much like the Monitor window, this window allows you to customize the display for the selected on-line CSD5 drive. The window displays a tree diagram with all the statuses that can be monitored for the selected drive.

To assign a specific input signal, or status, to the selected channel:

1. Open the tree control to the desired branch by clicking on one or more + (plus) signs.
2. Place a check mark in the box next to the desired input signal, or status.

3. Click OK. The selected input signal appears in the selected Channel in the Oscilloscope window.

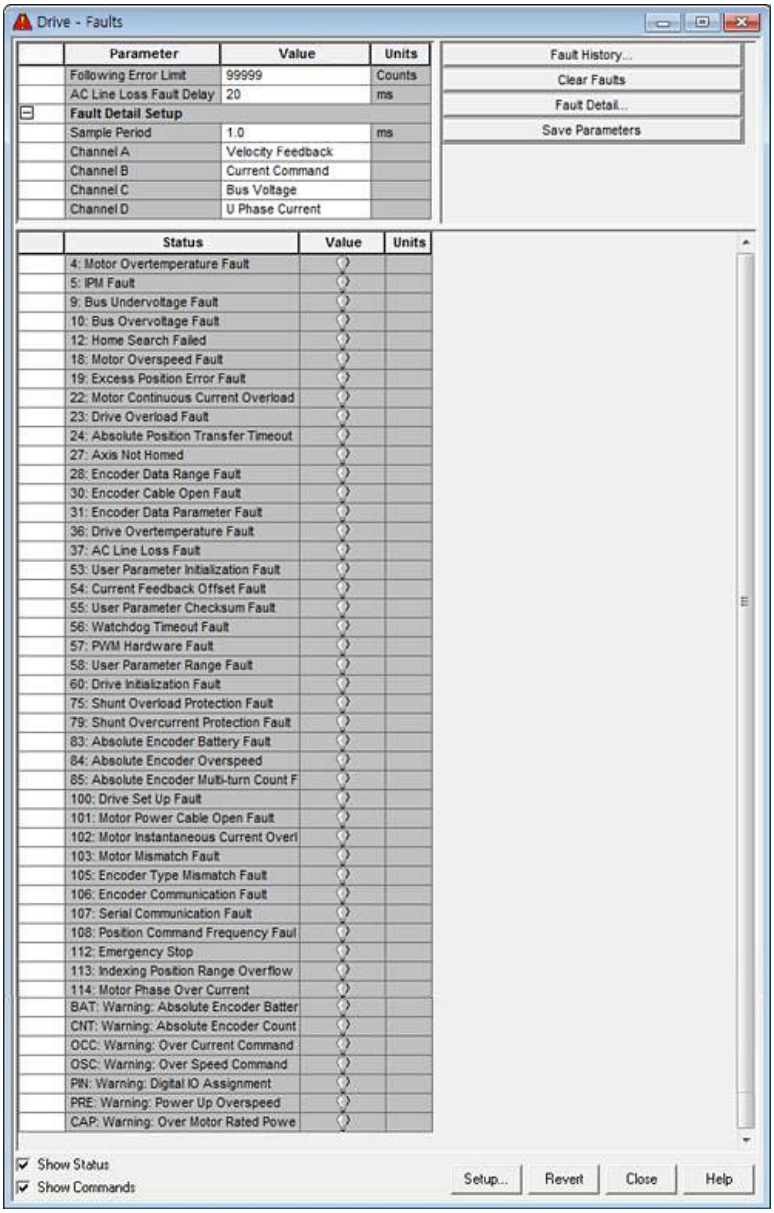
To assign no input signal, or status, to the selected channel:

1. Be sure no check marks appear next to any input signal, or status.
2. Click OK. The word Unassigned appears in the selected Channel in the Oscilloscope window.

Understanding the Faults Window

The Properties window for the Faults display looks like this:

Note: The Properties window for Faults of CSD5 Drive and KNX3 Drive are not same. The below is an illustration of CSD5 Drive. (Status 24 is deleted, Status 25, 86, 104 are added for KNX3 Drive.)



Use the Faults window to:

- Set fault limits
- Monitor fault statuses
- Execute the Clear Faults command
- Open a window where you can review the drive's fault history

The Faults window has the following parameters, statuses and commands associated with it:

Drive – Faults	
Drive – Faults – Following Error Limit	
Description	The minimum position error which triggers the Following Error fault.

Parameter	[Ft-5.10]
Range:	0~2,147,483,647
Default:	99999
Units:	Counts
Applicable Operating Mode:	Follower
When Enabled	Immediately
Drive – Faults – AC Line Loss Fault Delay	
Description	The AC Line Loss Fault is inhibited for this amount of time, when a loss of AC power is detected.
Parameter	[Ft-5.12]
Range:	20~1000
Default:	20
Units:	ms
Applicable Operating Mode:	All
When Enabled	Servo-Off -> Setting

The Faults window displays the status of the following faults:

Note: Status 24 is deleted, Status 25, 86, 104 are added for KNX3 Drive.

Status	Possible Cause	Measures/Solutions
4: Motor Overtemperature Fault	Motor thermal switch trips due to: •High motor ambient temperature, and /or •Excessive current	• Operate within the continuous torque rating (not exceeding) according to the ambient temperature. • Lower the ambient temperature or increase the motor cooling.
	Motor wiring error	•Check the wiring of the motor.
	Unsuitable motor selection	•Check if the motor selected is suitable.
5: IPM Fault	Motor cable shorted	•Check if the motor power cable and the connector are not shorted.
	Occurs when the winding wire of the motor is shorted internally.	Disconnect the motor power cable from the motor. If the motor will not be rotated by hand, a replacement may be needed.
	Occurs when exceeding the continuous power rating while operating.	•Check if the ambient temperature is too high. •Operate within the continuous power rating. •Decrease the acceleration rate.
	Occurs when an unsuitable IPM output, short circuit or overcurrent exist in the drive.	•Check the wiring connections that go from U, V, and W motor terminals to the DC BUS after disconnecting the power and the motor. If the connections are normal, check the wires between terminals or have the drive repaired.
9: Bus Undervoltage Fault	AC line/AC power input is low.	•Check the voltage level of the incoming AC power. •Check the noise pulse of the AC power or for a voltage drop. •Install an Uninterruptible Power Supply (UPS) to the AC input.
	Attempted to activate the drive without turning on the main power.	•Before activating the drive, turn on the main power.
10: Bus Overvoltage Fault	Occurs when the power regeneration is excessive. That is, the drive generates an error to protect itself from the overload when its main power supply regenerates excessive peak energy while the motor	•Increase the time assigned in Homing Time Limit (IN-01.11). •Set the value other than '0' in Homing Velcoity(IN-01.02) and Creep Velcoity(IN-01.03). •Check for an obstruction in homing. •Check the homing related parameter setting and mechanical parts.

	is run by the external mechanical power.	
	Excessive AC input voltage	•Check the specifications of the input.
12: Home Search Failed	Homing is incomplete within the time assigned in Homing Time Limit (IN-01.11).	•Increase the time assigned in Homing Time Limit (IN-01.11). •Set the value other than '0' in Homing Velocity (IN-01.02) and Creep Velocity (IN-01.03). •Check for an obstruction in homing. •Check the homing related parameter setting and mechanical parts.
18: Motor Overspeed Fault	Motor speed exceeds the maximum.	•Check the wiring of the encoder. •Retune the drive system. •Check the input gain of the torque or the external speed command.
19: Excess Position Error Fault	Occurs when the position error exceeds the allowed value.	•Increase the Following Error Limit value. •Check the position loop tuning.
22: Motor Continuous Current Overload Fault	Occurs when the internal filter that protects the motor from overheating trips.	•Decrease the acceleration rate. •Decrease the duty cycle (ON/OFF) of the motion assigned. •Increase the time for the motion allowed. •Use a drive or motor with bigger capacity. •Check the tuning.
23: Drive Overload Fault	Occurs when the drive average current exceeding the rated capacity is needed for the motion application.	•Decrease the acceleration rate. •Decrease the duty cycle (ON/OFF) of the motion assigned. •Increase the time for the motion allowed. •Use a drive or motor with bigger capacity. •Check the tuning.
24: Absolute Position Transfer Timeout Fault	Position Strobe input is not turned on/off within 5s from the rising/falling edge of Absolute Position Transfer Ready during Absolute Position Transfer Mode using photo coupler output. Absolute Position Transfer Mode input is not turned off within 5s after absolute data transfer completion	•Verify the sequential timing of Position Strobe & Absolute Position Transfer Mode input. •Verify continuity of I/O cable and connector.
25: Sensor Unassigned	The sensor (H_SENS, P-OT, N-OT) used in a selected Homing Type is not configured at the Digital Input.	•Configure the sensor to use in a selected Homing Type at the Digital Input. •Select a Homing Type in which a sensor (H_SENS, P-OT, N-OT) is not used.
27: Axis Not Homed	Occurs when an axis didn't return to home before the drive can operate an absolute coordinate index.	•Define the Home position
28: Encoder Data Range Fault	Occurs when the encoder is not properly programmed.	•Replace the motor.
	Occurs when the memory of the encoder is damaged.	
30: Encoder Cable Open Fault	Occurs when the communication with the interactive encoder cannot be established.	•Check the motor selected. •Check whether the motor supports an auto-detection. •Check the wiring of the encoder.
	Hall Error	
31: Encoder Data Parameter Fault	Occurs when the encoder is not properly programmed.	•Replace the motor.
	Occurs when the memory of the encoder is damaged.	

36: Drive Overtemperature Fault	Occurs when the drive overheats.	•Check if the cooling pan is working •Check the tuning. •Decrease the acceleration rate. •Decrease the duty cycle (ON/OFF) of the motion assigned. •Increase the time for the motion allowed. •Use a drive or motor with bigger capacity.
37: AC Line Loss Fault	Occurs when the power is low.	•Increase the instant outage compensation time.
	Attempted to activate the drive without turning on the main power.	•Before activating the drive, turn on the main power.
	A phase is not connected.	•Disconnect the power and check all mechanical connections.
	The alarm delay parameter is set too short.	•Increase the Alarm delay parameter value.
53: User Parameter Initialization Fault	An error exists in the parameter saved in the memory.	•Initialize the parameter. •Reset the values of the drive to the factory settings.
54: Current Feedback Offset Fault	Defective Hardware	•Replace the drive.
55: User Parameter Checksum Fault	Checksum Error	•Check the parameter and reset. •Reset the values of the drive to the factory settings.
56: Watchdog Timeout Fault	Excessive System Noise	•Check the wiring and the installation method.
	Defective Hardware	•Replace the drive.
57: PWM Hardware Fault	Defective Hardware	•Contact your nearest dealer.
58: User Parameter Range Fault	Parameter range is invalid.	•Input the parameter within the range. •Reset the values of the drive to the factory settings.
60: Drive Initialization Fault	Hardware Error	•Replace the drive.
75: Shunt Overload Protection Fault	Exceeds the value allowed by the voltage of the regeneration resistance.	•Adjust the motion profile and keep the regeneration resistance within the limit.
	Regeneration resistance is separated or damaged.	•Check the connection of the regeneration resistance. •Check the values of the regeneration resistance.
79: Shunt Overcurrent Protection Fault	The regenerative current exceeds the allowable instant value.	•Check if the regeneration resistance is shorted or damaged. •Check if the overload energy is excessive while decelerating.
83: Absolute Encoder Battery Fault	The constant of the encoder backup battery is set as 'installed,' but the battery is not installed.	•Set the constant of the encoder backup battery as 'not installed.'
	The battery voltage is detected under 2.7 V dc.	•Check the battery voltage and the connections. •Replace the battery.
84: Absolute Encoder Overspeed	The encoder rotates mechanically at high speed while turning off the drive, when it is powered by the battery.	•Remove the motor from the system. •Turn off and on the drive and reset the Warning.
85: Absolute Encoder Multi-turn Count Fault	Noise from Encoder	•Turn off and on the drive and reset the Warning.
	Defective Encoder	•Replace the motor.
86: Encoder Single-turn Count Fault	Noise in the encoder Defective encoder	•Cycle power to drive and reset alarm. •Replace motor.
100: Drive Set Up Fault	The drive operation mode and the motor selection are not compatible.	•Change the operation mode and/or motor selection, and reset the drive.
101: Motor Power Cable Open Fault	The motor cable is not connected.	•Check the power connection between the motor and the drive.
102: Motor Instantaneous Current Overload Fault	The motion profile requires peak current for a lengthy time.	•Check the wiring of the motor. •Adjust the acceleration/deceleration time. •Check if the motor selected is suitable.
	There is a defect in the current feedback detection.	•Check the phase current.
103: Motor Mismatch Fault	The dynamic control current of the selected motor exceeds double the value of the drive peak current rating.	•Install a different motor.

104 : Continuous Power Overload Fault	Motion application requires average drive power in excess of rated capability	•Reduce acceleration rates. •Reduce duty cycle (ON/OFF) of commanded motion. •Increase time permitted for motion. •Use larger drive and motor. •Check tuning.
105: Encoder Type Mismatch Fault	The motor encoder signal does not match the drive configuration.	•Check the motor selected.
	Defective Encoder	•Replace the motor.
106: Encoder Communication Fault	The wiring between the drive and the encoder is cut off or problematic. Or encoder signals are interrupted by the EMI (noise).	•Check the wiring of the encoder. •Contact your nearest dealer.
107: Serial Communication Fault	Communication error between the host and the drive (noise)	•Check the serial communication cable. •Check the noise of the serial communication interface.
108: Position Command Frequency Fault	The input frequency value exceeds the limit.	•Check if the hardware type selected in the drive matches the physical hardware. •Change from an open collector to a line drive. •Decrease the speed command. •Manipulate the gear.
112: Emergency Stop	Emergency Stop (E-STOP) is detected.	•Remove the emergency stop condition. •Erase E-STOP signal.
113: Indexing Position Range Overflow	The constant of the index position deviates the range.	•Use a value in the range between -2,147,483,647 ~ +2,147,483,647.
114: Motor Phase Over Current	•When the error occurs while turning on the power, there is a problem in the control or main power circuit. •When this error occurs while in operation, overcurrent exists. (current that is 300% over the rated current is supplied to the motor at more than 250 ms.)	•Check the wiring and the power. •Check the power and set or adjust the acceleration/deceleration time.
BAT: Warning: Absolute Encoder Battery	It occurs when the voltage of external battery of absolute encoder is 3.2 [V] or less.	• Replace the battery.
CNT: Warning: Absolute Encoder Count Overflow	In the event the Q, E Type Absolute Encoder is rotated forward or reverse over 32768 (H,J Type Absolute Encoder is for 4096) revolution, it is displayed.	•Reset the Absolute Encoder.
OCC: Warning: Over Current Command	When the external torque command is inputted with 300 [%] or more of the rated value, it is displayed.	•When the torque command is inputted for 300 [%] or more of the rated value, the drive is automatically limited at 300 [%]. Also, when lowering the external torque command to 300 [%] or less of the rated value, it automatically disassembled.
OSC: Warning: Over Speed Command	When the external speed command is inputted with the maximum speed or more of the motor, it is displayed.	•When the speed command is inputted with the maximum speed or more of the motor, the drive is automatically limited at the maximum speed of motor. Also, when the external speed command is lowered for less than the maximum speed or less of the motor, it automatically disassembled
PIN: Warning: Digital IO Assignment	When sequence input & output signal is duplicated and allotted to the same input and output channel. In mixed control mode, when the control mode conversion </C-SEL> sequence input signal is not allotted. In multi-step control mode, when speed command </C-DIR>,</C-SP1>, </C-SP2>, </C-SP3> sequence input signal is not allotted, it is	•Resetting sequence input & output signal. After resetting, it is effective only when the power is re-allowed.

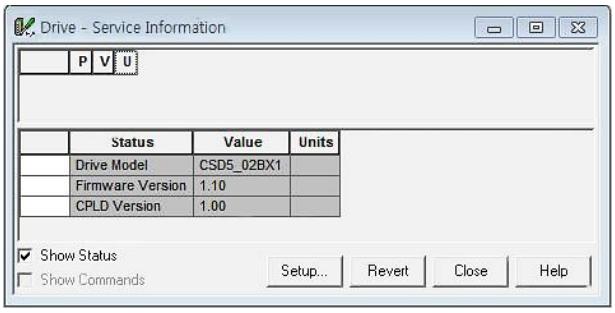
	displayed.	
PRE: Warning: Power Up Overspeed	There may be a time of motor rotating for over 100[RPM] when main power is ON.	•It only occurs in the event of Absolute Encoder serial of Q, E Type. And when the resolution of 1 rotation data is 17bit, it automatically disassembled.
PRE: Warning: Power Up Overspeed	It occurs when motor power is set higher than the drive rated output.	•Use a motor suitable to the drive or set the torque limit below the drive capacity.

Customize the Faults window for your CSD5 Drive branch by selecting one or more of the following buttons:

- Toggle the **Show Status** selection to display or hide the Status pane.
- Toggle the **Show Commands** selection to display or hide the Commands pane.
- Click on the **Setup** button to open the Monitor Setup window, where you can customize the status display for this window.
- Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

Understanding the Service Information Window

The Service Information window looks like this:



Use the Service Information window to:

- Display and monitor service information about the drive.
- Display the firmware version of the drive.

The following statuses apply to the Service Information window:

Status	Description
Drive Model	The model number of the drive. This is the number you selected from the Select New Drive dialog after executing the Insert CSD5 command.

The following statuses apply to the Service Information window:

Status	Description
Drive Model	The model number of the drive. This is the number you selected from the Select New Drive dialog after executing the Insert CSD5 command.
Firmware Version	The version of the selected On-Line drive's firmware in the format XX.YY, where: XX = major revision YY = minor revision
CPLD Version	The version of the selected On-Line drive's CPLD in the format X.YY, where: X = major revision YY = minor revision

Customize the Service Information window for your CSD5 Drive branch by selecting one or more of the following buttons:

- Toggle the **Show Status** selection to display or hide the Status pane.
- Toggle the **Show Commands** selection to display or hide the Commands pane.
- Click on the **Revert** button to return parameter settings to the values they held when you opened this window.

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