

## DriveControlSuite V 6.5-L

This release contains many new features for **Predictive Maintenance** relating to the load matrix, life performance indicator and available gear unit types. **Additional functions** open up new possibilities in type Drive Based applications, while a new wizard increases commissioning convenience for **PROFIdrive** applications.

### ■ Predictive Maintenance

You can expect the following new features for Predictive Maintenance. Information on Predictive Maintenance can be found in the manual for the respective drive controller as usual, and now in the DS6 online help as well.

#### • Life performance indicator

The gear ratio and instances where the maximum emergency stop torque  $M_{2NOT}$  was exceeded by 90% are now taken into account for calculating the life performance indicator. Another new feature: the weakest bearing at the time of calculation is used as a reference (parameter: R120 – R122).

#### • Maximum service life

Predictive Maintenance now recommends replacing the geared motor once it has been in operation for 100,000 h or more (operating time: R123). Maximum service life is a separate indicator and is not taken into account when calculating the life performance indicator.

#### • Load matrix

The load matrix functions now have their own wizard (wizard: Load matrix). When sending the load matrix, you can now view a preview of the data, store contact information (name, company, email) and include additional information or questions via a free text field. If there is no online connection between DriveControlSuite and the drive controller or if the project contains reverse documentation for the drive controller in question, the buttons for sending or exporting the load matrix are now inactive. The CSV export of the load matrix has been optimized for further processing with spreadsheet programs and now includes a language-dependent separator.

#### • 3D load matrix

A new wizard now visualizes the load matrix data for you in the form of a 3D model that you can freely rotate and scale (wizard: Load matrix 3D).

#### • Gear unit selection

Predictive Maintenance now also supports single-type multi-stage gear units and is therefore available for a wide range of gear unit types, such as C, F, K, KL, S, P, PH, PHQ and PE. Two-speed gearboxes, combined gear units and KS and KX gear units are currently not supported. In addition, the table for gear unit selection now also contains the description for the code from the type designation in the bearing design, shaft design and gear unit option columns.

#### • Database ID

You can also parameterize the database ID for unique identification of the geared motor during the manual configuration of Predictive Maintenance now (parameter: R119).

### ■ Additional functions

The **Additional functions** wizard has been reworked in all applications and has the following new features.

#### • Additional counter function

Drive Based applications: The new additional counter function provides you with up to 4 independent counters with which you can implement smaller automation tasks directly in the drive controller, such as direct or indirect control of the digital outputs (parameters: N40 – N47; wizard: Counters).

#### • Additional motor potentiometer function

Drive Based applications: The additional motor potentiometer function has been expanded to include 2 new setting options in which initialization is triggered with Enable-off (parameter: G368; selection: 4, 5). In addition, the associated wizard has been arranged more clearly (wizard: Motor potentiometer).

#### • Additional comparator function

Drive Based applications: In addition to the INT32 and REAL32 comparators, there are now comparators for the INT8 and INT16 data types, including associated wizards (parameters: C134 – C149; wizards: INT8 comparators, INT16 comparators).

- **Additional fieldbus-controlled analog output function**

CiA 402, Drive Based applications: The additional function for controlling analog outputs via fieldbus can now be conveniently parameterized with its own wizards, e.g. for the indirect control of an actuator at the analog output (wizards: Fieldbus-controlled analog output 1, Fieldbus-controlled analog output 2). The additional function is available for fieldbus communication via EtherCAT, PROFINET and now also for CANopen.

- **Additional extended cam control unit function**

Drive Based applications: The extended cam control unit is now also available for drive controllers of the SC6 and SI6 series, as brake connections X2A and X2B have been able to be used as digital outputs if no brake is connected since DS6 V 6.5-K and associated firmware (prerequisite: F00 = 0: Inactive).

- **PROFIdrive: Drive data**

PROFIdrive applications: A new wizard makes commissioning easier thanks to an overview of the drive data (reference torque, reference speed, maximum speed) that must be transferred unchanged to the TIA Portal (wizard: Drive data).

## More new features

- **Graphical programming**

You can expect the following new features in the graphical programming.

- **Program overview**

You can now use the toolbar to display an overview window that shows all blocks on the current level and highlights the currently visible section of the drawing area with a rectangle. You can use the program overview to navigate across the drawing area by moving the rectangle for the visible section with the cursor. You can scale the program overview by dragging the edge of the window larger or smaller with the cursor.

- **Parameter description**

If you create your own parameters with parameter blocks, you can now create parameter descriptions for them (Properties window, Description tab). The parameter description is displayed in the both parameter list in the lower margin area and the graphic editor as a tooltip when you hover over the parameter block with the cursor.

- **Signal properties**

The properties of signals (signal name, initial value, remanence) are highlighted by symbols on the signal line and are now easier to distinguish using tooltips.

- **Show block in graphic editor**

On the Search tab, in the Result area > Structure view, you can now display a hit in the graphic editor by double-clicking.

- **S1 operating button**

SC6, SI6: From hardware version  $\geq 50$ , there is the S1 operating button on the top of the device (nameplate: HW  $\geq 50$ ; parameter: E52[1]  $\geq 50$ ). From firmware version V 6.5-L, you can use the S1 operating button to perform actions such as saving the configuration in non-volatile memory, temporarily deactivating the fan or acknowledging faults. You can also use the S1 operating button to reset the IP address of the drive controller by holding it down when switching on until both LEDs are off for the first time (approx. 3 seconds).

- **Scope: Free channel scaling**

You can now freely scale both the channel (y-axis) and the time axis (x-axis) in the image editor by entering the desired scaling factor directly in the respective field and, if necessary, defining the desired unit for the time axis (ns,  $\mu$ s/us, ms, s). Free channel scaling makes it easier to compare channels or parameters with different scaling, e.g. for comparing set and actual values.

- **Wake & Shake action**

There is now a separate action (parameter: B50) for commutation finding via Wake & Shake when using incremental encoders in combination with a brake.

- **Reference retention during device replacement**

SC6, SI6: The axis reference is now retained when replacing the device if you proceed as follows: save the configuration of the drive controller on the SD card for the referenced axis. Replace the drive controller and start the new drive controller with the SD card inserted. Save the configuration on the new drive controller, remove the SD card and then restart the drive controller. The axis remains referenced after the device has been replaced and restarted.

- **Brake control, release override**

You can now select the source for the brake release override using the new parameter F06. External brake control by a controller is now carried out using the new parameter F101. For drive controllers of the SC6 and SI6 series, the F92 parameter has been replaced by F108 and F97 by F07, in keeping with the SD6 series. Parameter F07 now serves as an interface to the firmware for all series.

- **Brake chopper: On limit**

SC6, SI6: As with drive controllers of the SD6 series, our system support can now set the on limit of the brake chopper for the SC6 and SI6 series as well if required: for example, if you are using a linear motor with a 1-phase feed-in and weak insulation (parameter: A24).

- **Monitor synchronous operation**

SC6, SI6: In type Drive Based Synchronous applications, it is now also possible to monitor synchronous operation for double-axis controllers; information on parameterization can be found in the associated manual in version 03 or later.

- **EtherCAT: ESI file**

If you create a new ESI file from DriveControlSuite, it now contains a comment with the DriveControlSuite version with which the ESI file was originally created. In addition, the object directory has been expanded to include the Torque slope communication object in accordance with CiA 402 and the ESI file has been updated accordingly (parameter: A561).

- **Velocity feedforward control**

For special applications, the upper limit value for the velocity feedforward control of the position controller has been increased to 250% (parameter: I25).

## Optimizations

- **Fault memory**

For greater accuracy and better traceability, the time interval between the triggering of a fault and the recording of the displayed values for the fault memory has been minimized and behavior when faults occur almost simultaneously has been optimized (e.g. for 33: Overcurrent and 31: Short/ground).

- **Maximum quick stop duration**

The maximum quick stop duration is now only taken into account for Enable-off and not for SS1 or SS2 (parameter: A39).

- **Motion control panel**

The default values of Control panel motion have been adjusted to the default values of Jog control panel (parameters: K404, K405, K406, K407).

- **Parameter check, messages**

The entries in the Parameter check window now have their own Level column, similar to the entries in the Messages window. Entries in the Messages window can now be filtered by level using new context menus, similar to the entries in the Parameter check window.

- **PROFIdrive: Torque/force limit**

In type PROFIdrive applications with Siemens telegram 105 and Siemens additional telegram 750, limiting the set torque/set force was optimized: first in the context of torque reduction (MOMRED) and second when using the TorqueRange block in the TIA Portal with limit values > 200%.

- **CiA 402: Velocity mode (vl)**

In CiA 402 applications, the polarity of the axis model is now taken into account in Velocity mode (vl) and you can now limit the set velocity by the maximum permissible velocity (parameters: I03, I10).

- **CiA 402: Referencing**

In CiA 402 applications, optimizations were made for changing from Homing mode back to Cyclic synchronous position mode (csp) (referencing method: A586 = 35, 37).

- **Overview of inputs and outputs used**

Minor optimizations have been made for the overview of the drive controller connections used (wizard: Terminals > Inputs/outputs used).

- **Safety configuration: CRC**

You can now also view the checksum of the security configuration in the wizard, for example for device replacement (parameter: S09[2]; wizard: Monitoring: Safety function).

- **Security logger**

SC6, SI6: As it is not possible to trace who actually carried out the firmware update when updating the firmware using an SD card, neither the name of the user nor the PC is logged in this case.

- **Direct connection**

SC6, SI6: With an active firewall and fixed IP address for the network adapter, drive controllers now remain visible in the Add connection dialog box after a direct connection has been established if the IP address is assigned automatically (address assignment: A166 = 2: DHCP + DS6).

- **Scope: Long-term recordings**

The measured value display has been optimized for long-term recordings.

- **Motion block operating mode**

In Drive Based applications, motion block operating mode for evaluating Execute signals in case of a direct motion block start or motion block end control unit was optimized.

- **Wizards: Actions**

Wizards for actions such as optimizing the current controller, testing phases, testing windings, etc. no longer time out after successful execution if a large number of parameters have to be written for the motor.

- **Wizards: Sensitive block diagrams**

If you move the cursor over interactive elements such as links in block diagrams, the cursor now changes visually.

- **Virtual master: Quick stop**

To make it easier for you to parameterize the quick stop for the virtual master, additional parameters have been added to the wizard in type Drive Based Synchronous applications (parameters: G56, G57; wizard: Virtual master).

- **Actual current limit**

For special applications, the actual current can now be limited to avoid event 33: Overcurrent (parameters: B712, B713). The new parameters are not functionally implemented in the standard system; corresponding write access to the graphical programming is required.

- **Control unit temperature**

The display for the control unit temperature has been corrected (parameter: E25[1]).

- **Process data mapping**

SD6: When you reconfigure the device control and application from Drive Based to CiA 402 or vice versa after the fact, changes to the process data mapping are now reset and the standard mapping of the respective application is restored.

- **Graphical programming**

You can expect the following optimizations in the graphical programming.

- **Read parameters**

- For the smart block for reading parameters, the runtime sequence for using the Element as input option has been optimized (block: 300005).

- **Data type converter**

- The Datentypkonverter smart block has been optimized by new system block versions for the elegant, low-runtime conversion of data types, especially with regard to the conversion from DWORD to REAL32 (block: 300004).

- **Parameter blocks**  
Minor optimizations have been made for the creation of user-defined parameters; for example, the next free coordinate is now suggested by default instead of P00.
- **Constant value**  
The latest version of the block is now inserted via the `Enter constant` context menu at the block input (block: 8000008).
- **Analog input AI3**  
The scaled value of analog input AI3 is now calculated in real time (block: 100017).
- **Standard libraries**  
Some blocks have been moved from the Parameters standard library to the thematically more appropriate Applications standard library.
- **DS6 block help**  
The DS6 block help can now also be opened using [F1] for blocks starting from number 800000.



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