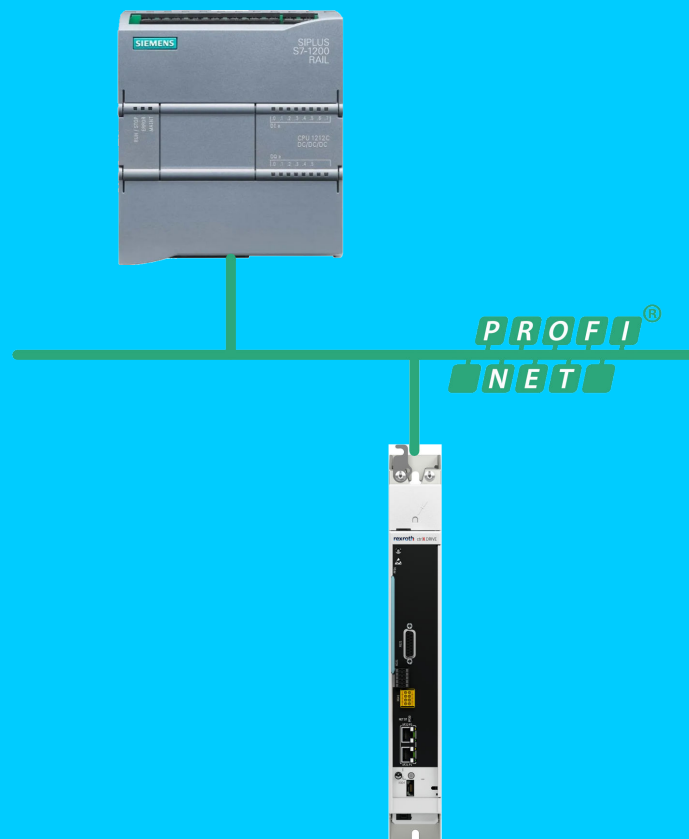


ctrlX DRIVE

Siemens PROFINET

Controlling Supply Units with Function Block



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DOK-XDRV**-TIA*_PN_PS*-RE01-EN-P

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3 About this documentation

This documentation describes the PLC function block FB_PN_PowerSupply_cXD.

The function block FB_PN_PowerSupply_cXD enables the control of ctrlX DRIVE supply units and power sections via PROFINET communication with Siemens TIA PLC CPUs of the S7-1200 and S7-1500 series.

With the help of the function block FB_PN_PowerSupply_cXD the following is facilitated:

- Identifying internal states of the device
- Handling transitions between the state machines of the device
- Controlling the operating mode
- Clearing errors of the device
- Reading out diagnostic information of the device

Furthermore, this documentation describes the required settings in ctrlX DRIVE, the Siemens control and in the TIA Portal to be able to use the FB_PN_PowerSupply_cXD function block.

Editions of this documentation

Edition	Release date	Comment
01	2023-12-07	First edition

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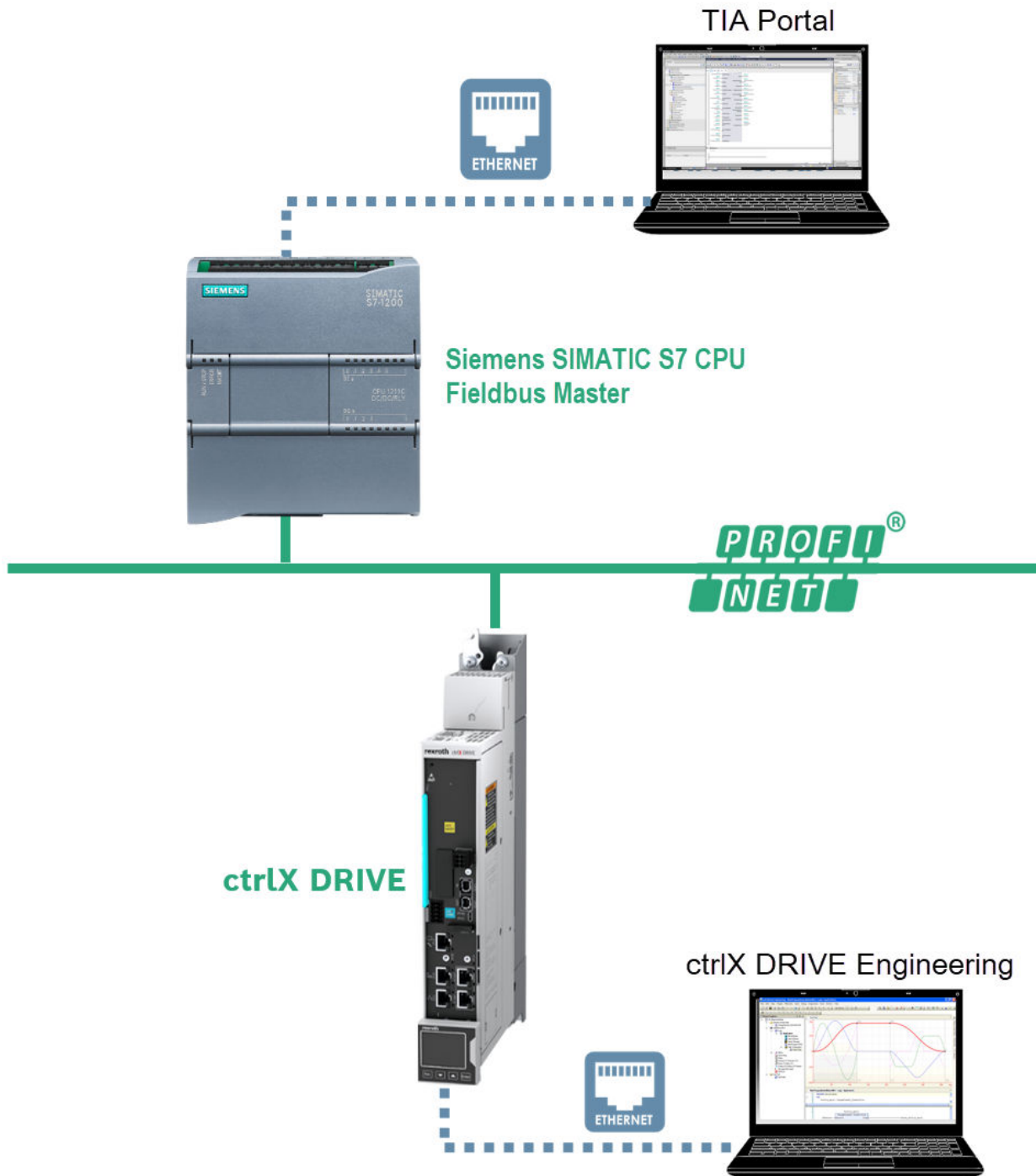
4 Configuration

4.1 Overview

The following chapters describe the required settings in ctrlX DRIVE, the Siemens control and in the TIA Portal to use the PLC function block

The figure shows a ctrlX DRIVE drive controller as PROFINET IO device with a Siemens control as PROFINET IO controller.

The initial configuration of ctrlX DRIVE is carried out with ctrlX DRIVE Engineering. The access to parameters and the operation of ctrlX DRIVE is carried out via the Siemens control and with the help of the PLC with the TIA Portal software.



4.2 Configuration – ctrlX DRIVE Engineering

The following paragraphs describe the required configuration of ctrlX DRIVE by means of ctrlX DRIVE Engineering.



See also Application Manual of firmware "Establishing a connection to the drive"

Prerequisites

- ctrlX DRIVE Engineering has been installed
- ctrlX DRIVE uses at least firmware AXS-V-0308 or newer

Configuring the master communication of ctrlX DRIVE

1. The master communication of ctrlX DRIVE has to be set to “PROFINET”.

Selecting the application profile:

- AXS-V-0402 and below: “Sercos profile” has to be selected as application profile.
- AXS-V-0404 and above: “FSP Drive profile” has to be selected as application profile.

To change the master communication, restart ctrlX DRIVE.

➔ Master communication and application profile have been configured.

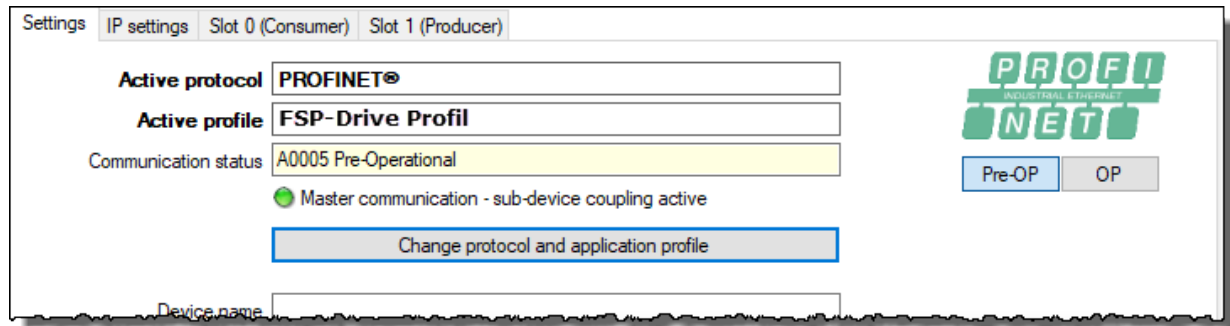


Fig. 1: Configuring the master communication

Configuring process data in AT and MDT

2. Configuring the parameters required for the [Example program](#) in the process data.

➔ Process data to be configured in the AT

- S-0-0135, Servodrive profile: Status word
- S-0-0144, Signal status word: Value
- S-0-0386, Position controller: Position actual value
- S-0-0535, Velocity controller: Velocity actual value
- S-0-0390, Diagnostic message: Manufacturer status register
- S-0-1720.0.2, Power supply control: Status word

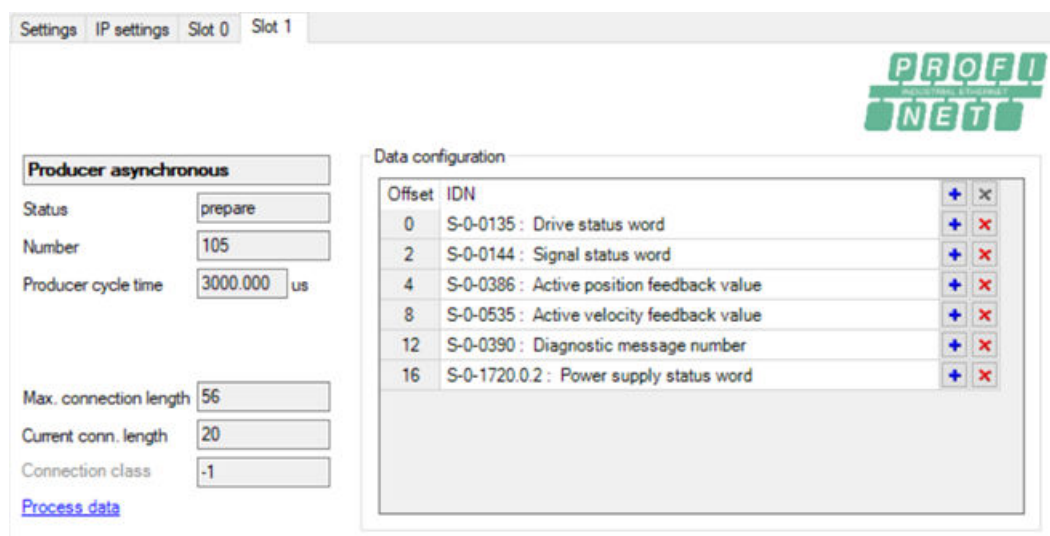


Fig. 2: Configuring process data in AT

Process data to be configured in the MDT:

- S-0-0134, Servodrive profile: Control word
- S-0-0145, Signal control word: Value
- S-0-0282, Drive-controlled positioning: Command value
- S-0-0259, Positioning profile: Profile velocity
- S-0-0260, Positioning profile: Acceleration
- S-0-0359, Positioning profile: Deceleration
- S-0-1720.0.1, Power supply control: Control word

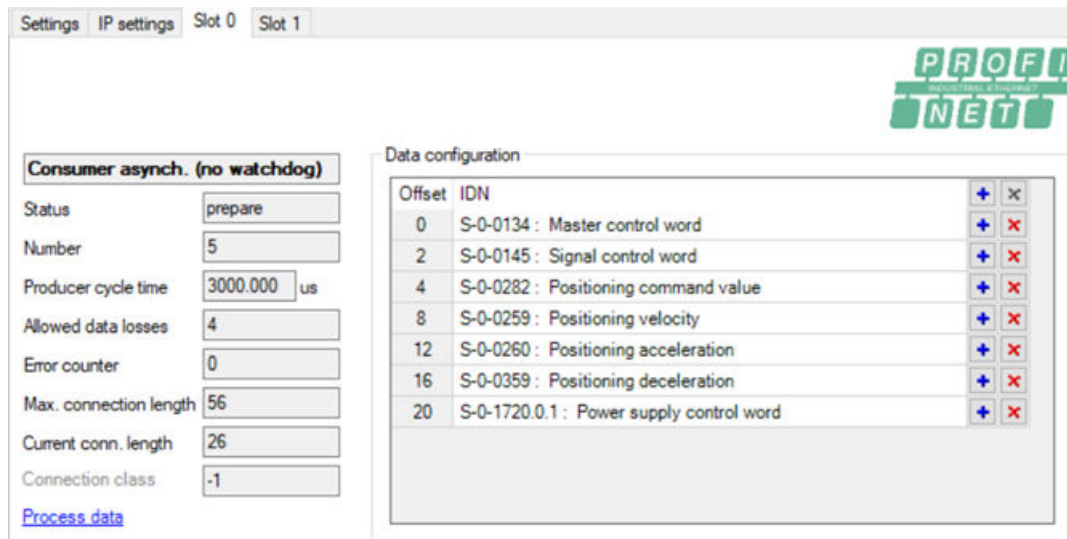


Fig. 3: Configuring process data in MDT

Configuring the signal control word

3. ➤ Configuring the target parameters and bit numbers in the signal control word (S-0-0144).

Status	Target parameter	Bit number
Bit 0: <input type="radio"/>	S-0-0000.0.0: <empty>	0
Bit 1: <input type="radio"/>	S-0-0000.0.0: <empty>	0
Bit 2: <input type="radio"/>	S-0-0000.0.0: <empty>	0
Bit 3: <input type="radio"/>	S-0-0000.0.0: <empty>	0
Bit 4: <input type="radio"/>	S-0-0000.0.0: <empty>	0
Bit 5: <input type="radio"/>	S-0-0099.0.0: Class 1 diagnostics: C0500 Reset command	0
Bit 6: <input type="radio"/>	S-0-0000.0.0: <empty>	0
Bit 7: <input type="radio"/>	S-0-0000.0.0: <empty>	0
Bit 8: <input type="radio"/>	S-0-0000.0.0: <empty>	0
Bit 9: <input type="radio"/>	S-0-0000.0.0: <empty>	0
Bit 10: <input type="radio"/>	S-0-0000.0.0: <empty>	0
Bit 11: <input type="radio"/>	S-0-0000.0.0: <empty>	0
Bit 12: <input type="radio"/>	S-0-0000.0.0: <empty>	0
Bit 13: <input type="radio"/>	S-0-0000.0.0: <empty>	0
Bit 14: <input type="radio"/>	S-0-0000.0.0: <empty>	0
Bit 15: <input type="radio"/>	S-0-0000.0.0: <empty>	0

Fig. 4: PN_PowerSupply_cXD_Signal control word settings - ctrlX DRIVE Engineering.png

Configuring the signal status word

4. ➤ Configuring the source parameters and bit numbers in the signal status word (S-0-0145).

Status	Source parameter	Bit number
Bit 0: <input type="radio"/>	S-0-0424.0.0: Subdevice STM: Status, parameterization mode	0
Bit 1: <input checked="" type="radio"/>	S-0-0424.0.0: Subdevice STM: Status, parameterization mode	1
Bit 2: <input type="radio"/>	S-0-0437.0.0: Positioning status: Word	2
Bit 3: <input type="radio"/>	S-0-0419.0.0: Drive-controlled positioning: Command acknowledgment	0
Bit 4: <input type="radio"/>	S-0-0331.0.0: Velocity status: Actual value = 0	0
Bit 5: <input type="radio"/>	P-0-0115.0.0: Axis state machine: Status word, axis	5
Bit 6: <input type="radio"/>	S-0-0000.0.0: <no signal>	0
Bit 7: <input type="radio"/>	S-0-0000.0.0: <no signal>	0
Bit 8: <input type="radio"/>	P-0-0110.0.0: Axis state machine: Status word 2, axis	7
Bit 9: <input type="radio"/>	S-0-0000.0.0: <no signal>	0
Bit 10: <input type="radio"/>	S-0-0000.0.0: <no signal>	0
Bit 11: <input type="radio"/>	S-0-0000.0.0: <no signal>	0
Bit 12: <input type="radio"/>	S-0-0000.0.0: <no signal>	0
Bit 13: <input type="radio"/>	S-0-0000.0.0: <no signal>	0
Bit 14: <input type="radio"/>	S-0-0000.0.0: <no signal>	0
Bit 15: <input type="radio"/>	S-0-0000.0.0: <no signal>	0

4.3 Configuration – Siemens TIA Portal

The following paragraphs describe the required configuration of ctrlX DRIVE in the Siemens TIA Portal.



For questions about the TIA Portal, please refer to the TIA Portal help.

Prerequisites

- TIA Portal has been installed
- Siemens control Simatic S7-1200 or Simatic S7-1500 is available

1. ➤ Start TIA Portal.

Make sure that ctrlX DRIVE is available in the hardware catalog of the TIA Portal

2. ➤ ctrlX DRIVE has to be included in the hardware catalog of the TIA Portal.

If ctrlX DRIVE is not available in the hardware catalog of the TIA Portal, the GSDML file of ctrlX DRIVE has to be installed. Alternatively, the provided example program can be opened. ctrlX DRIVE then is automatically available in the hardware catalog of the TIA Portal.

To manually install the GSDML file of ctrlX DRIVE, proceed as follows:

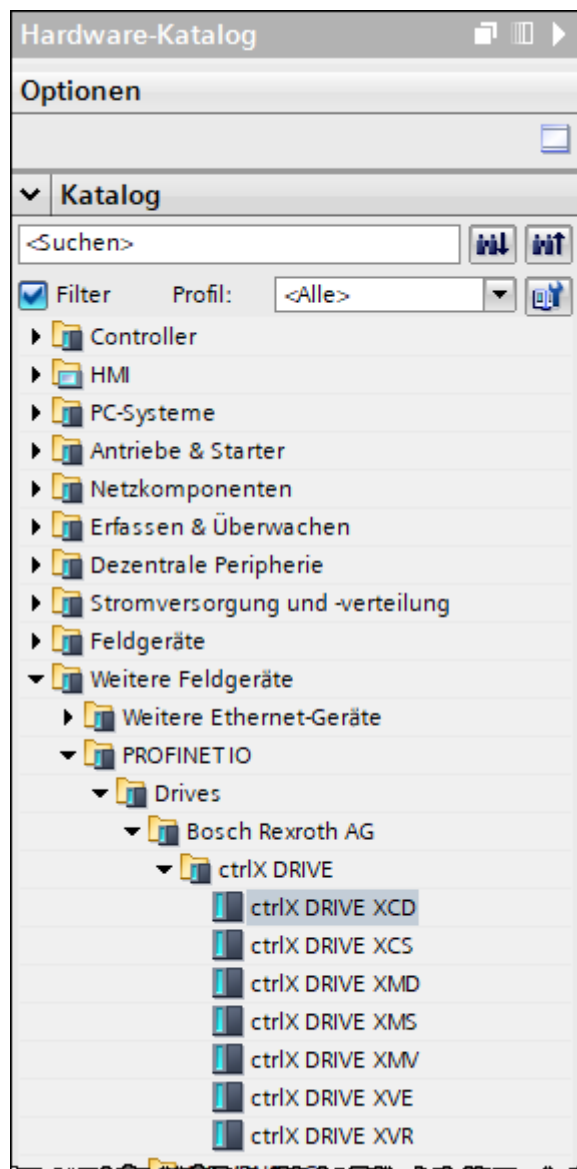
1. The GSDML file of ctrlX DRIVE is included in the ZIP archive. Unpack the ZIP archive.

📌 The GSDML files are also included in the installation directory of ctrlX DRIVE Engineering or ctrlX WORKS. To go directly to the installation directory of ctrlX DRIVE Engineering, call the “Help → Device data sheets” menu in ctrlX DRIVE Engineering.

If the TIA software is changed, this also has to be adjusted:

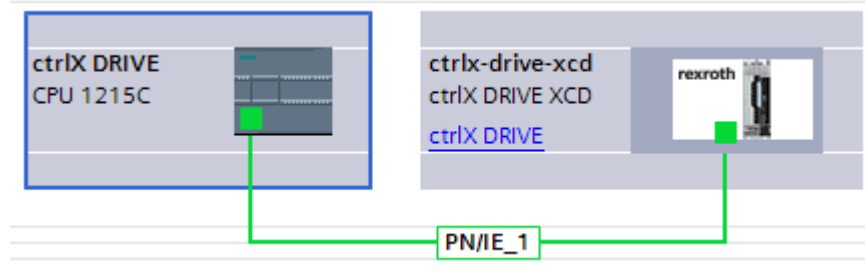
2. Install the GSDML in the TIA Portal (for the required steps, please see the Help of the TIA Portal).

➔ ctrlX DRIVE is available in the hardware catalog of the TIA Portal.



Network configuration

3. ▶ ctrlX DRIVE is configured as PROFINET IO device in the PROFINET network. The parameters in the cyclic data channel (AT and MDT) are predefined as input and output modules in the hardware catalog.
 - ➔ The network connection is as shown in the exemplary figure.



ctrlX DRIVE configuration – Adding input and output modules

4. ▶ The input and output modules in the hardware catalog are to be added to ctrlX DRIVE.
 - ➔ The input and output modules are mapped.

The screenshot shows the 'Device overview' table and the 'Catalog' on the right. The table lists modules for 'ctrlX-drive-xcd'. A red arrow points from the 'Axis 1 input_1' module in the catalog to the 'Axis 1 input_1' module in the device overview table. A blue icon with the number 2 is next to 'Axis 1 input_1' in the table, and a blue icon with the number 1 is next to 'Axis 1 input_1' in the catalog.

Module	Slot	I address	Q address	Type
ctrlX-drive-xcd	0	0		ctrlX DRIVE XCD
XCD interface PF30	0	0 X1		ctrlX-drive-xcd
Axis 1 output_1	0	Axis 1 output		Axis 1 output
Axis 1 input_1	0	Axis 1 input		Axis 1 input
Axis 1 safety output	0	Axis 1 safety output		Axis 1 safety output
Axis 1 safety input	0	Axis 1 safety input		Axis 1 safety input
Axis 2 output	0	Axis 2 output		Axis 2 output
Axis 2 input	0	Axis 2 input		Axis 2 input
Axis 2 safety output	0	Axis 2 safety output		Axis 2 safety output
Axis 2 safety input	0	Axis 2 safety input		Axis 2 safety input

ctrlX DRIVE configuration – Address assignment

5. To be able to access the input and output modules with the help of the function block and to exchange data, it is necessary to assign the addresses to the structures of the input and output modules.

➔ The following figure shows the use of the "I_address" and "Q_address" values as they are configured in ctrlX DRIVE.

Important: For "I_address" and "Q_address", the address numbers have to have the order shown.

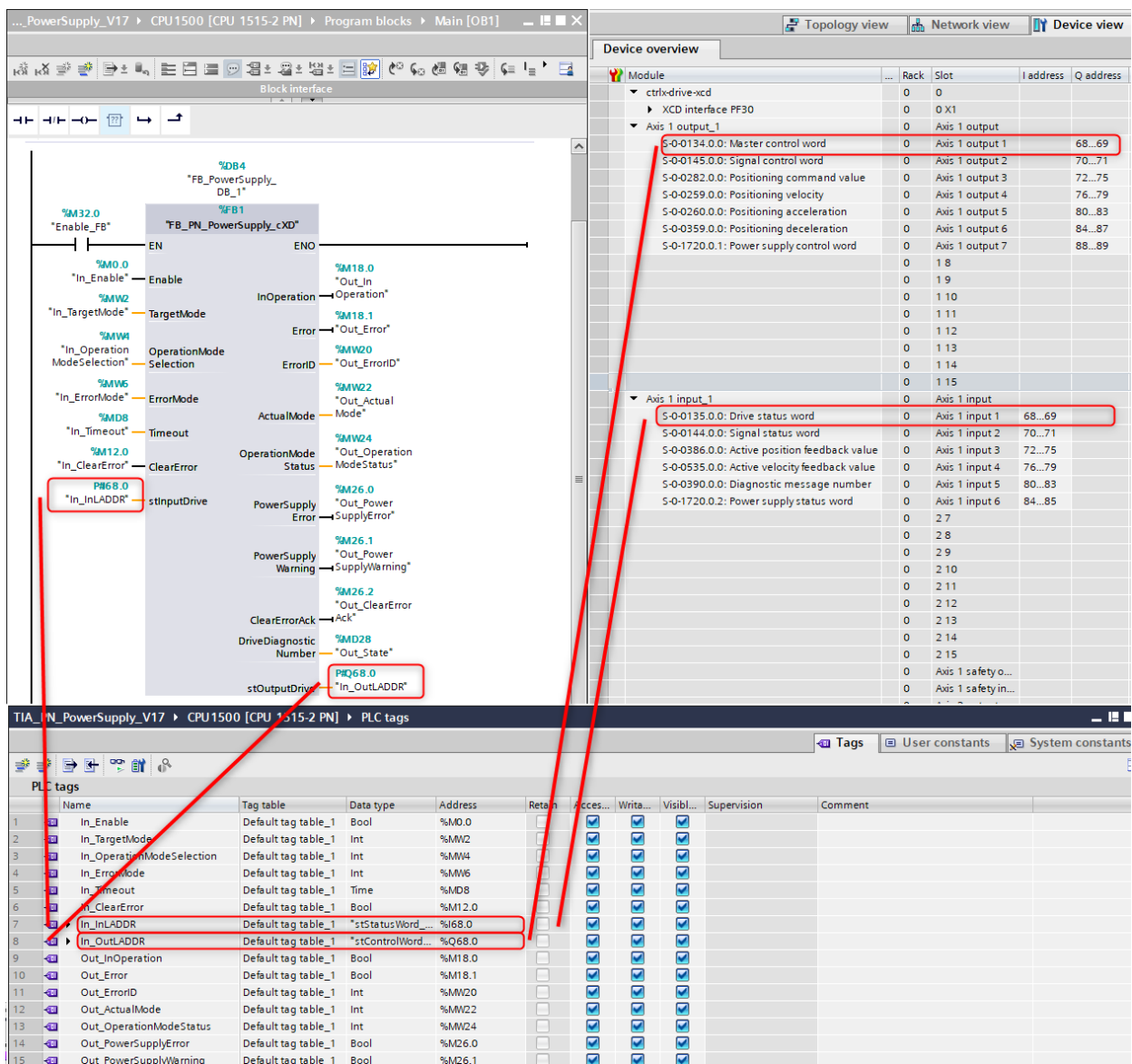
- Control word (`Axis 1 output_1`):
 - S-0-0134 and S-0-0145
 - S-0-1720.0.1
- Status word (`Axis 1 input_1`):
 - S-0-0135 and S-0-0144
 - S-0-1720.0.2
- Diagnostics: S-0-0390

ⓘ "Axis 1 output_1" and "Axis 1 input_1" are slots at the Siemens TIA PLC CPU.

The I- and Q-addresses have to be linked to the function block by means of variables:

- Variable `In_InADDR WORD %68.0` → `FB.stInputDrive`
- Variable `In_OutADDR WORD %68.0` → `FB.stOutputDrive`

To correctly declare the variables, please observe ➔ [Table 1 Interface variables of the FB_PN_PowerSupply_cXD function block on page 21](#).



5 Description of the FB_PN_PowerSupply_cXD function block

Brief description

The function block FB_PN_PowerSupply_cXD enables the control of ctrlX DRIVE supply units and power sections via PROFINET communication with Siemens TIA PLC CPUs of the S7-1200 and S7-1500 series.

With the help of the function block FB_PN_PowerSupply_cXD the following is facilitated:

- Identifying internal states of the device
- Handling transitions between the state machines of the device
- Controlling the operating mode
- Clearing errors of the device
- Reading out diagnostic information of the device

The main function of the function block FB_PN_PowerSupply_cXD is to perform a transition of the power supply to the requested target mode.

Interface description

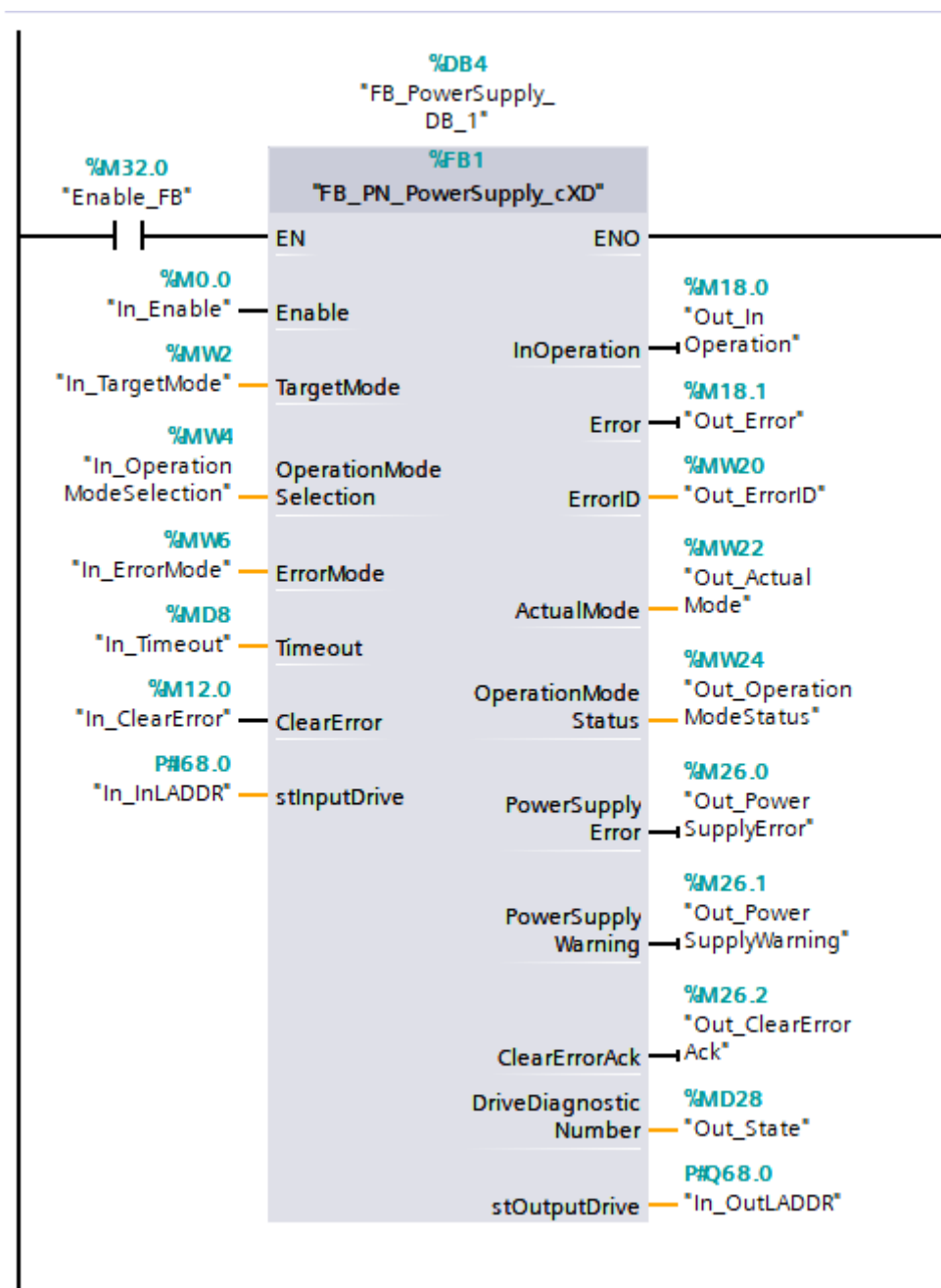


Fig. 5: FB_PN_PowerSupply_cXD function block

Table 1: Interface variables of the FB_PN_PowerSupply_cxD function block

I/O type	Name	Data type	Description
VAR_INPUT	Enable	Bool	1: The function block is being processed
	TargetMode*	Int	<p>Selection of the target mode to be reached by the power supply.</p> <ul style="list-style-type: none"> 1 (MAINS_OFF_NO_DISCHARGE): The power supply should immediately switch to the "Mains off" state, i.e. without discharging the DC bus 2 (MAINS_OFF_DISCHARGE): The power supply should first discharge the DC bus and then switch to the "MAINS_OFF" state 3 (DC_POWER_OFF_NO_DISCHARGE): The power supply is to be switched to the "DC_POWER_OFF" state, independently of its current "ActualMode". 4 (DC_POWER_OFF_DISCHARGE): The power supply is to perform the discharge of the DC bus and then change to the "DC_POWER_OFF" state 5 (DC_BUS_CHARGED): The power supply is to change to the "DC bus charged" state. 6 (OPERATION_MODE): The power supply is to change to the operating mode
	OperationModeSelect	Int	<p>Selecting the operating mode for supply unit / power section:</p> <ul style="list-style-type: none"> 1: Primary operation mode (S-0-1709.0.1) 2: Secondary operation mode 1 (S-0-1709.0.2) 3: Secondary operation mode 2 (S-0-1709.0.3) 4: Secondary operation mode 3 (S-0-1709.0.4) <p>Tip: The selected operation mode is also displayed in the control word of the power supply (S-0-1720.0.1); the prerequisite for this is that the external control of the supply unit / power section via the field bus has been configured (P-0-0860, bit 16/17="00").</p>
	ErrorMode*	Int	<p>Selecting the state to which the supply unit / power section is to change to when leaving an error state:</p> <ul style="list-style-type: none"> 1 (ERROR_TRANSITION_NO_DISCHARGE): Depending on the target mode, the function block switches either to "MAINS_OFF" or "DC_POWER_OFF" - DC discharge does not take place 2 (ERROR_TRANSITION_DISCHARGE): The function block switches to "DC_DISCHARGING" and terminates it before switching to the next state
	Timeout	Time	Maximum time allowed for the transition from "ActualMode" to "TargetMode"
	ClearError	Bool	<p>Clearing an error in the device using the command "Clear error" (S-0-0099).</p> <p>After the error has been cleared, operation of the function block can be resumed by resetting the "Enable" input and setting it again.</p>
	stInputDrive	stStatusWord_cxD	Input address of the AT parameters from the hardware configuration for the power supply

I/O type	Name	Data type	Description
VAR_OUTPUT	InOperation	Bool	Status parameter with the following values: <ul style="list-style-type: none"> ● 0: Function block is out of operation ● 1: Function block is active
	Error	Bool	Status parameter with the following values: <ul style="list-style-type: none"> ● 0: No error ● 1: Error occurred during function block execution
	ErrorID	Int	At the "ErrorID" output, an error code for the current error of the function block is output in the event of an error: <ul style="list-style-type: none"> ● 1000: Operation mode selection input is invalid ● 1001: Target mode input is invalid ● 1002: Error mode input is invalid ● 1003: Current mode is in unknown state ● 1004: Timeout on transition ("ActualMode" → Target-Mode)
	ActualMode	Int	Current state of the state machine of the power supply <ul style="list-style-type: none"> ● 1 (MAINS_OFF): "Mains off" The power supply is not connected to the mains. If there is an output for controlling the mains contactor, the mains contactor has been switched off. ● 2 (DC_POWER_OFF): The mains contactor has been switched on. Charging of the DC bus has not been started yet ● 3 (DC_BUS_CHARGING): The charging process of the DC bus voltage is active. If necessary, this process can be interrupted by changing the "TargetMode" input. ● 4 (DC_DISCHARGING): The DC bus is discharged. If necessary, this process can be interrupted by changing the "TargetMode" input. ● 5 (DC_BUS_CHARGED): The DC bus is charged to the peak voltage of the mains. No operation mode is active. ● 6 (OPERATION_MODE): The selected operation mode is active. ● 7 (ERROR): The power supply has detected an error, the error bit in the status word is set to "1" and the corresponding error number is contained in S-0-0390. ● 99 (UNKNOWN_STATE): The status word of the power supply does not correspond to a valid state. The error is reported by the function block
	OperationModeStatus	Int	Current operating mode of the supply unit / power section: <ul style="list-style-type: none"> ● 0: Primary operation mode (S-0-1709.0.1) ● 1: Secondary operation mode 1 (S-0-1709.0.2) ● 2: Secondary operation mode 2 (S-0-1709.0.3) ● 3: Secondary operation mode 3 (S-0-1709.0.4) Tip: The current operation mode is also displayed in the status word of the power supply (S-0-1720.0.2).

I/O type	Name	Data type	Description
	PowerSupplyError	Bool	Status parameter with the following values: <ul style="list-style-type: none"> 0: No error 1: An internal error has occurred in the supply unit / power section
	PowerSupplyWarning	Bool	Status parameter with the following values: <ul style="list-style-type: none"> 0: No warning 1: An internal warning has occurred in the supply unit / power section
	ClearErrorAck	Bool	Status parameter with the following values: <ul style="list-style-type: none"> 0: The "Clear error" command S-0-0099 was not executed or not executed successfully 1: The "Clear error" command S-0-0099 was executed successfully
	DriveDiagnostic-Number	DInt	Number of the diagnostic message from "PowerSupplyError" or "PowerSupplyWarning"
	stOutputDrive	stControlWord_cxD	Output address of the MDT parameters from the hardware configuration for the power supply

Legend:

*: There may be a conflicting combination of values at "ErrorMode" and "TargetMode". In such cases, "TargetMode" has priority over "ErrorMode", regardless of the input value (see also the following example).

Example of a conflicting combination of values at "ErrorMode" and "TargetMode":

The current mode (ActualMode) is in the error state.

The target mode (TargetMode) is "DC_POWER_OFF_NO_DISCHARGE".

The error mode (ErrorMode) is "ERROR_TRANSITION_DISCHARGE".

⇒ When the power supply leaves the error state, target mode (TargetMode) and error mode (ErrorMode) request this:

- The target mode (TargetMode) requests the power supply to go to the "DC_POWER_OFF" state without discharging the DC bus.
- The error mode (ErrorMode) requests the power supply to discharge the DC bus before it goes to the next state.

In this situation, the target mode (TargetMode) has priority and the power supply is switched to the "DC_POWER_OFF" mode without discharging the DC bus.

See also Application Manual of firmware "Power supply state machine"

Minimum, maximum and default values of the inputs

The values of the function block inputs are applied continuously.

Name	Data type	Minimum value	Maximum value	Default value
Enable	BOOL	FALSE	TRUE	FALSE
TargetMode	INT	1	6	1=MAINS_OFF_NO_DISCHARGE
OperationModeSelection	INT	1	4	1=Primary operation mode (S-0-1709.0.1)
ErrorMode	INT	1	2	1=ERROR_TRANSITION_NO_DISCHARGE
ClearError	BOOL	FALSE	TRUE	FALSE
Timeout	TIME	Not defined	Not defined	T#10s (10 seconds)

Functional description

The function block FB_PN_PowerSupply_cxD enables the control of ctrlX DRIVE supply units and power sections via PROFINET communication with Siemens TIA PLC CPUs of the S7-1200 and S7-1500 series.

With the help of the function block FB_PN_PowerSupply_cxD the following is facilitated:

- Identifying internal states of the device
- Handling transitions between the state machines of the device
- Controlling the operating mode
- Clearing errors of the device
- Reading out diagnostic information of the device

The main function of the function block FB_PN_PowerSupply_cxD is to perform a transition of the power supply to the requested target mode.

The power supply status word (S-0-1720.0.2) is used by the function block to determine the current state of the power supply State Machine. The target mode to be reached by the power supply State Machine has to be selected at the "TargetMode" input.

The time the device needs to get from the "ActualMode" to the "TargetMode" is monitored by means of the time set at the "Timeout" input. If this time is exceeded, an error is generated and the processing of the State Machine is stopped.

When the enabling input "Enable" of the function block is reset, the function block determines the current state of the power supply and then decides whether or not it is necessary to bring the power supply to the "DC_POWER_OFF" state.

Error handling

Due to invalid inputs or due to the Timeout time having elapsed, the function block may go to an error state. In both cases, the function block signals an error and stops operation. The user has to remove the cause of the error, then reset the "Enable" input and set it again to resume operation of the function block.

If an error occurs, this is displayed at the "Error" output with "TRUE".

In the case of a function block error, processing is stopped until the error has been resolved. When the device goes to the error state, the values at "Error-Mode" and "TargetMode" decide on the next immediate state of the device. The "Error" and "ErrorID" outputs provide the required information in the case of a function block error. The update of the function block outputs depends on the PLC task cycle and PROFINET cycle.

The "ClearError" input provides the option to clear errors in the device. A rising edge at the "ClearError" input triggers the "Clear error" command [C0500 (S-0-0099)]. The status of the "Clear error" command is provided via the "ClearErrorAck" output of the function block.

The diagnostic information of the device is continuously updated at the "Power-SupplyError", "PowerSupplyWarning" and "DriveDiagnosticNumber" outputs.

6 Example program

Introduction

The example program included in the package provides an insight into how to implement the function block with its respective instances.

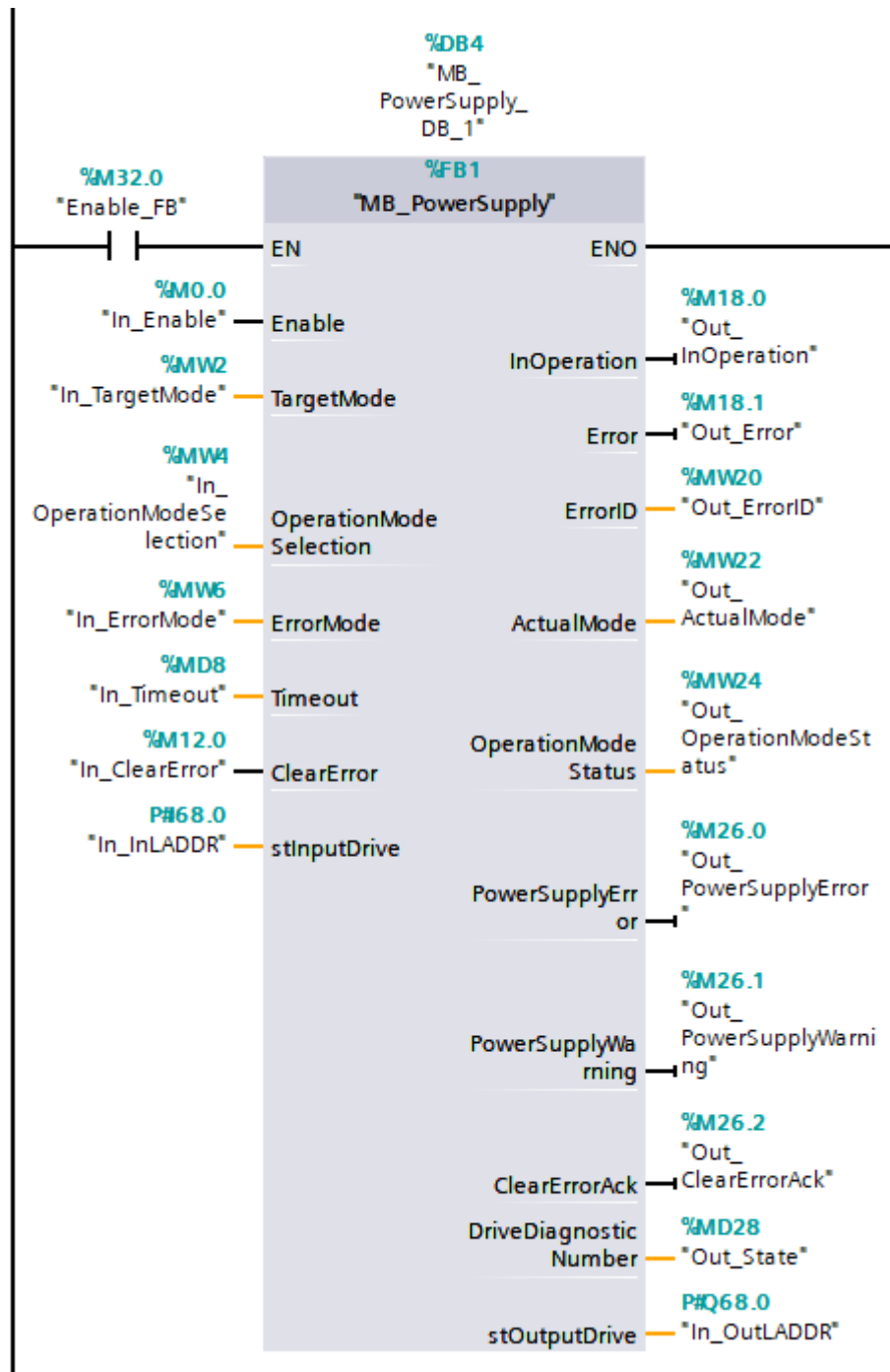


Fig. 6: Calling the function block

Target mode "DC_POWER_OFF_NO_DISCHARGE " after initial switching-on

Initially, when ctrlX DRIVE has been connected to the PLC and switched on, the power supply mode of ctrlX DRIVE is "MAINS_OFF" by default.

To change the power supply mode via the function block, use the "TargetMode" tag. At "TargetMode" enter the value for "DC_POWER_OFF_NO_DISCHARGE", whereupon the function block writes the corresponding data to the control word (S-0-1720.0.1). In this step, the bb contact is closed (S-0-1720.0.1, bit 12 "0"→"1").

Check the current state at the "ActualMode" output of the function block: "MAINS_OFF" → "DC_POWER_OFF_NO_DISCHARGE ".

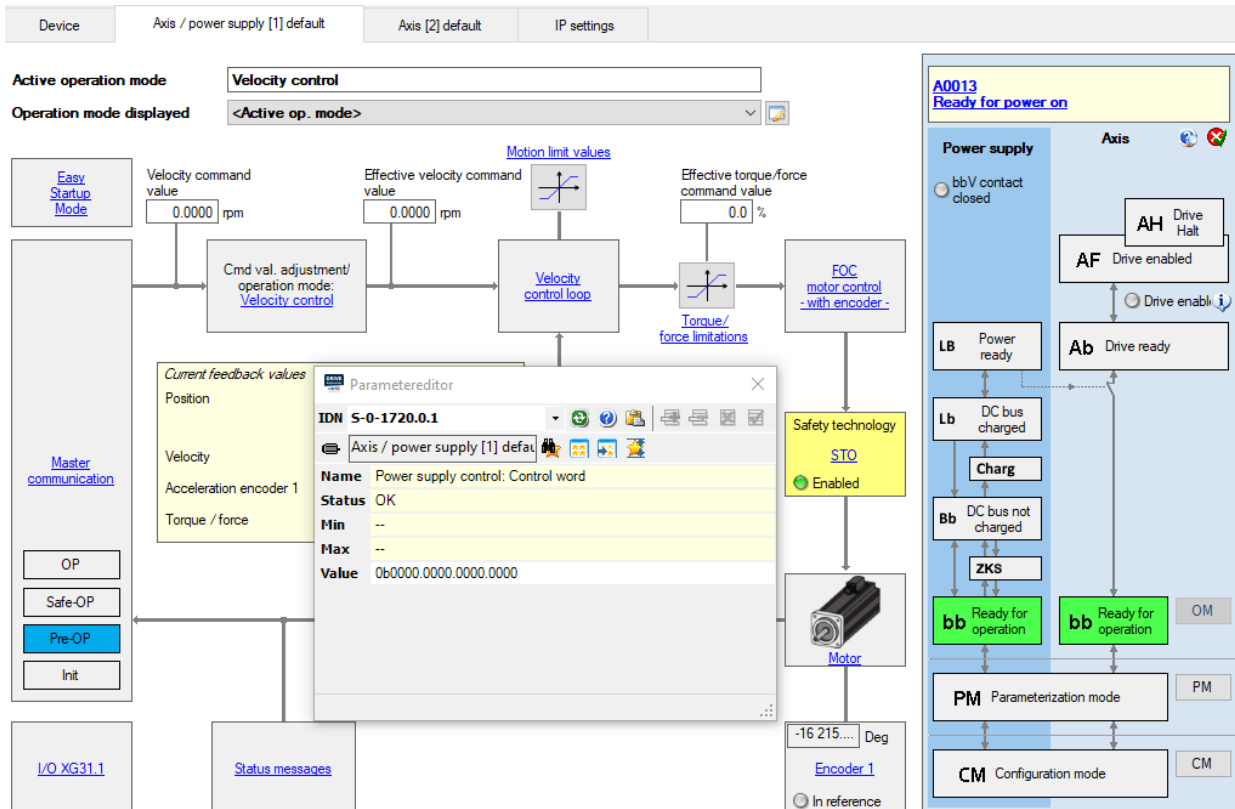


Fig. 7: "MAINS_OFF" mode

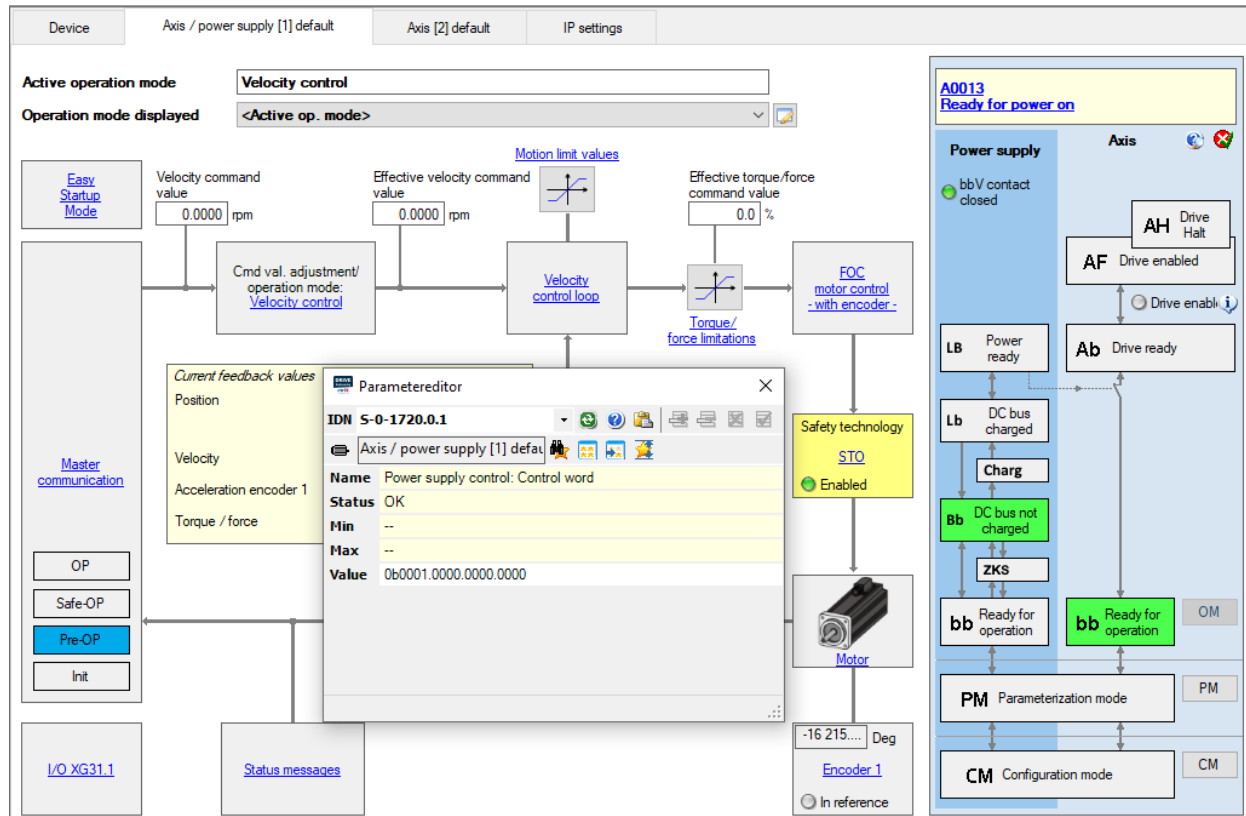


Fig. 8: Target mode "DC_POWER_OFF_NO_DISCHARGE " after initial switching-on

Switching from "DC_POWER_OFF_NO_DISCHARGE" to target mode "DC_BUS_CHARGED"

Now change the power supply mode from "DC_POWER_OFF_NO_DISCHARGE" to "DC_BUS_CHARGED" and visualize the change in ctrlX DRIVE with ctrlX DRIVE Engineering.

To change the power supply mode via the function block, use the "TargetMode" tag. At the "TargetMode" tag, enter the value for "DC_BUS_CHARGED" at which the function block writes the corresponding data to the control word (S-0-1720.0.1)

Check the current state at the "ActualMode" output of the function block: "DC_POWER_OFF" → "DC_BUS_CHARGING" → "DC_BUS_CHARGED".

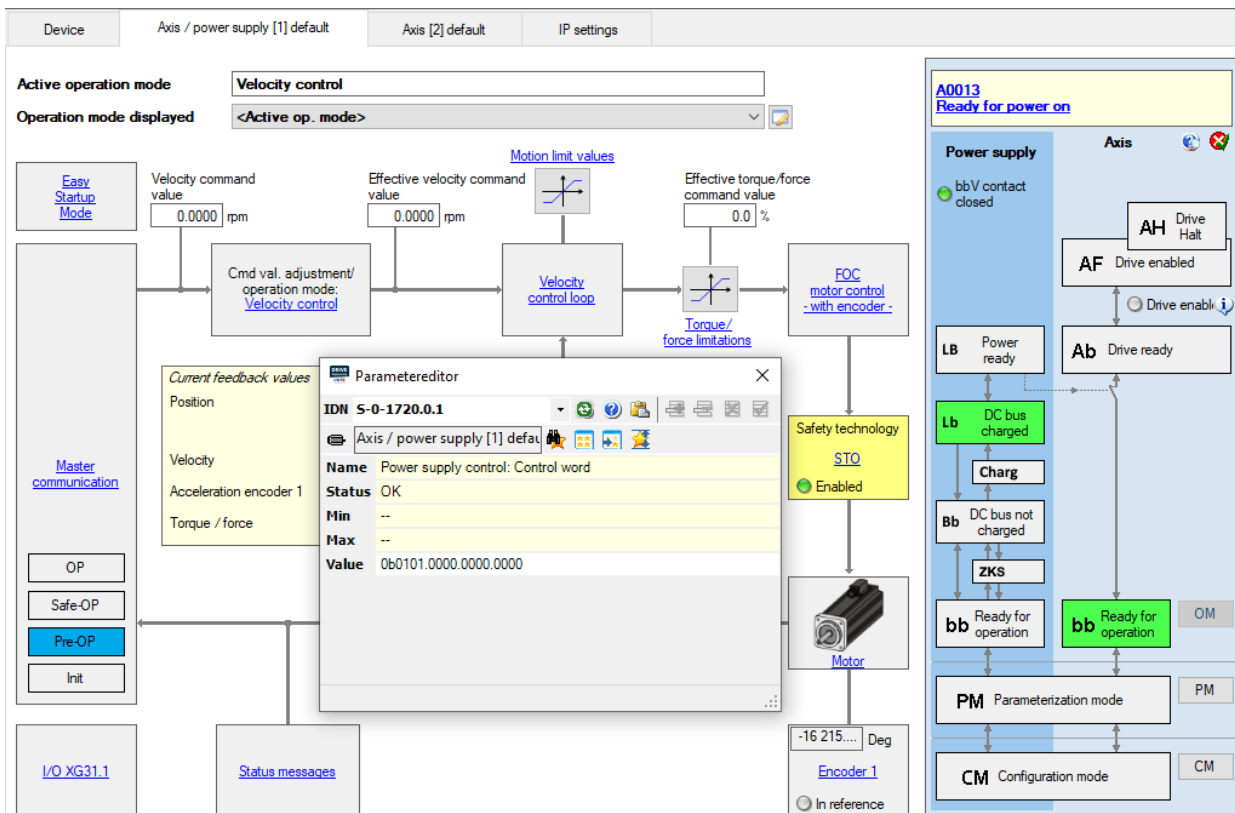


Fig. 9: Target mode "DC_BUS_CHARGED"

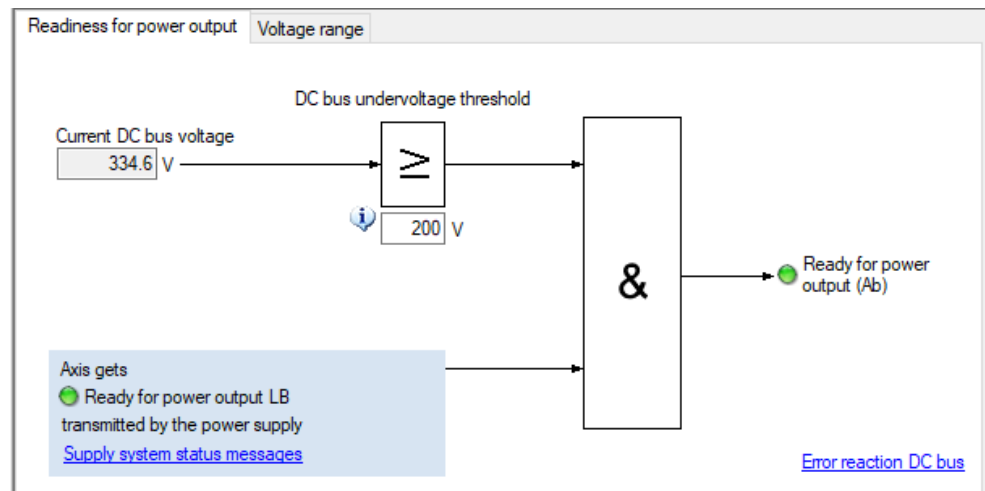


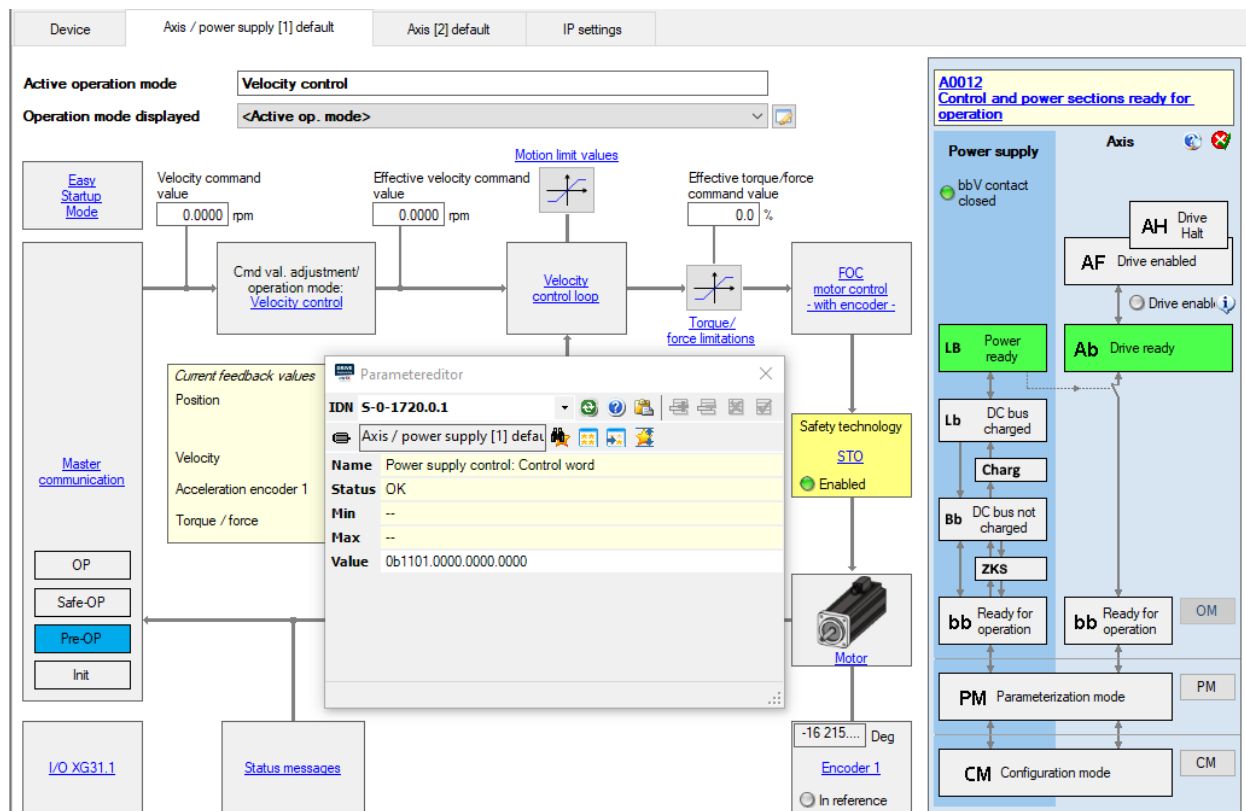
Fig. 10: DC bus voltage measurement (DC bus charged)

Switching from "DC_BUS_CHARGED" to target mode "OPERATION_MODE"

Now change the power supply mode from "DC_BUS_CHARGED" to "OPERATION_MODE" and visualize the change in ctrlX DRIVE with ctrlX DRIVE Engineering.

To change the power supply mode via the function block, use the "TargetMode" tag. At the "TargetMode" tag, enter the value for "OPERATION_MODE" in which the function block writes the corresponding data to the control word (S-0-1720.0.1)

Check the current state at the "ActualMode" output of the function block: "DC_BUS_CHARGED" → "OPERATION_MODE".



Switching from "OPERATION_MODE" to target mode "DC_POWER_OFF" and DC bus not charged

Now change the power supply mode from "OPERATION_MODE" to "DC_POWER_OFF" and visualize the change in ctrlX DRIVE with ctrlX DRIVE Engineering.

To change the power supply mode via the function block, use the "TargetMode" tag. At the "TargetMode" tag, enter the value for "DC_POWER_OFF_NO_DISCHARGE", whereupon the function block writes the corresponding data to the control word (S-0-1720.0.1).

Check the current state at the "ActualMode" output of the function block: "OPERATION_MODE" → "DC_POWER_OFF" and DC bus not charged.

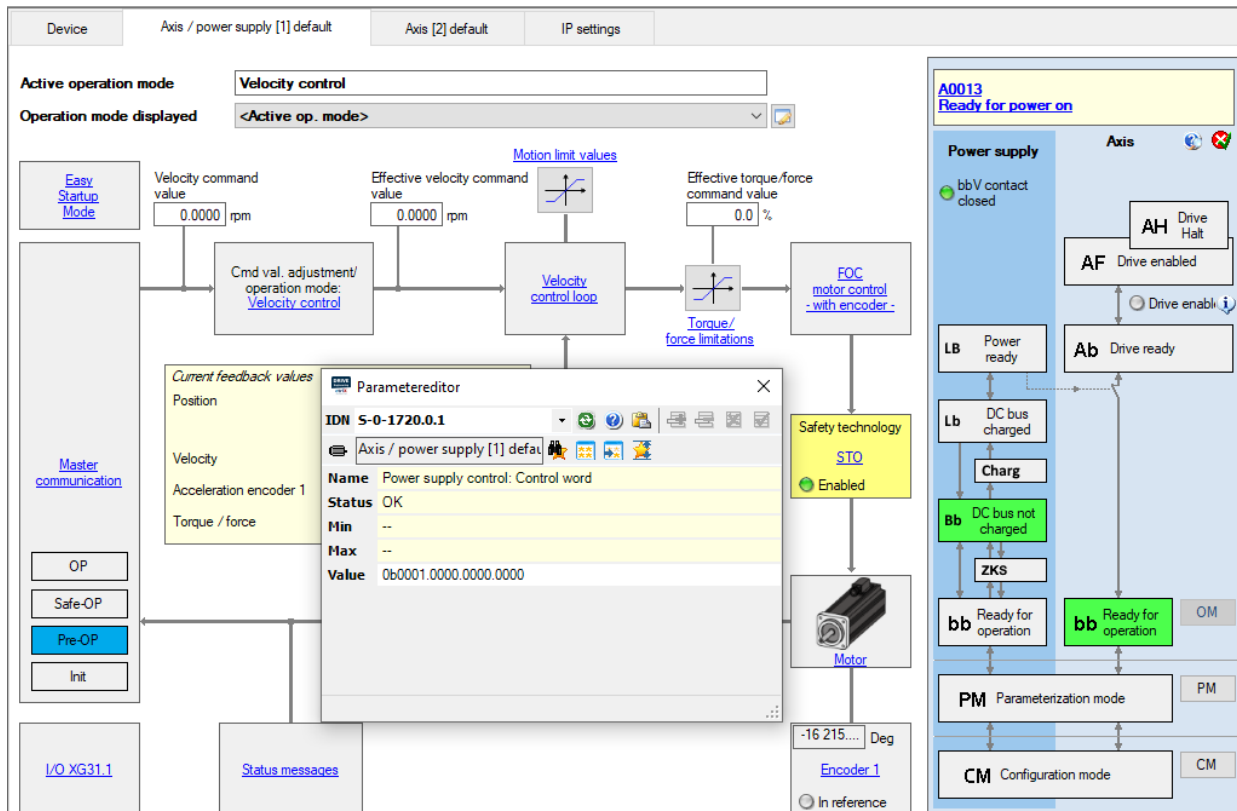


Fig. 11: Target mode "DC_POWER_OFF" and DC bus not discharged

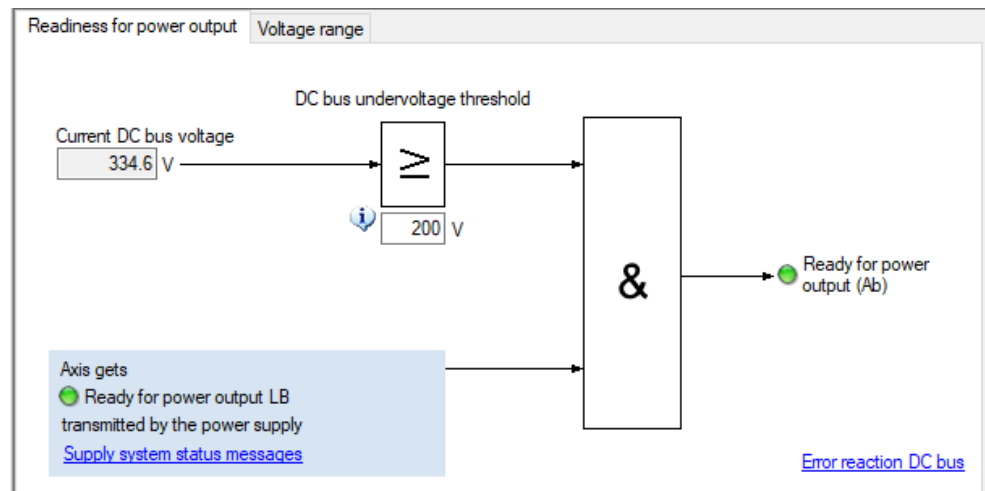


Fig. 12: DC bus voltage measurement (DC bus charged)

Switching from "OPERATION_MODE" to target mode "DC_POWER_OFF_DISCHARGE"

Now change the power supply mode from "OPERATION_MODE" to "DC_POWER_OFF_DISCHARGE" and visualize the change in ctrlX DRIVE with ctrlX DRIVE Engineering.

To change the power supply mode via the function block, use the "Target-Mode" tag. At the "TargetMode" tag, enter the value for "DC_POWER_OFF_DISCHARGE", whereupon the function block writes the corresponding data to the control word (S-0-1720.0.1).

Check the current state at the "ActualMode" output of the function block: "OPERATION_MODE" → "DC_BUS_DISCHARGING" → "DC_POWER_OFF" and DC bus discharged.

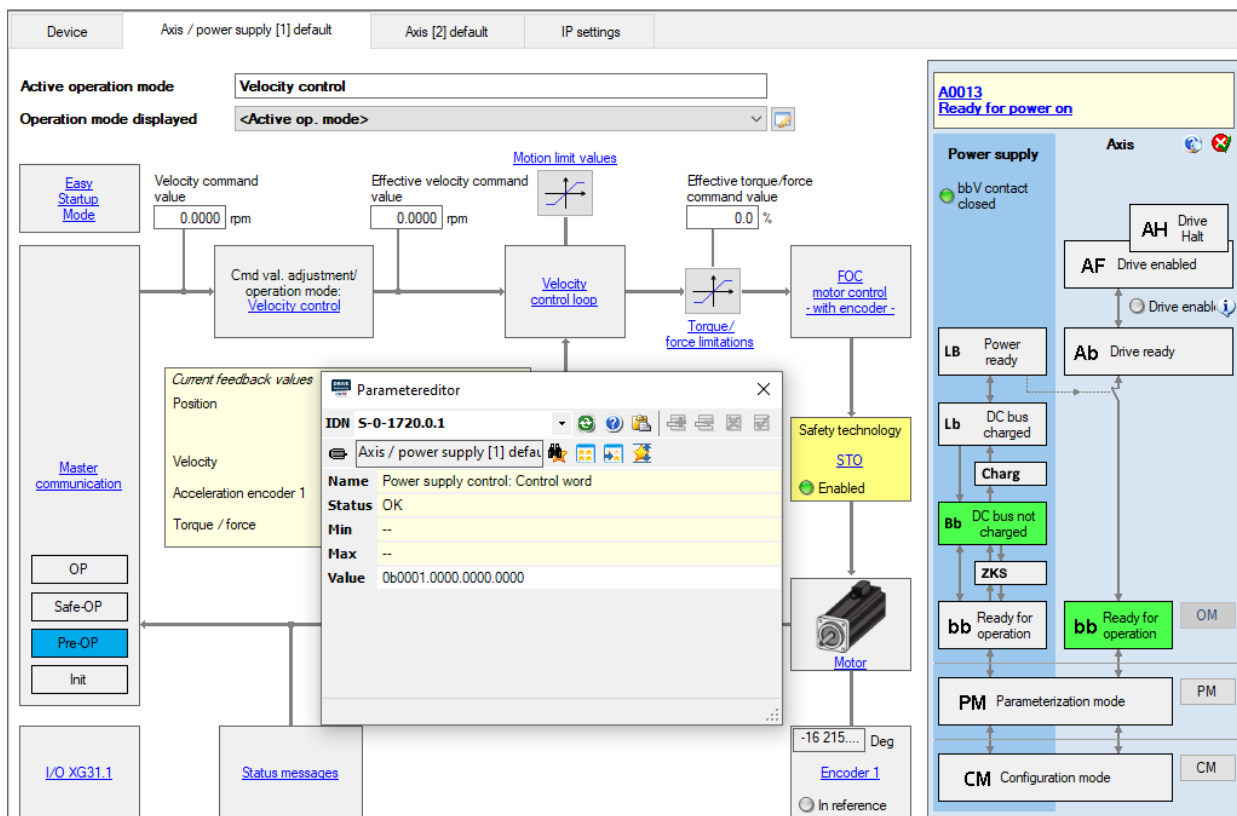


Fig. 13: Target mode "DC_POWER_OFF" and DC bus discharged

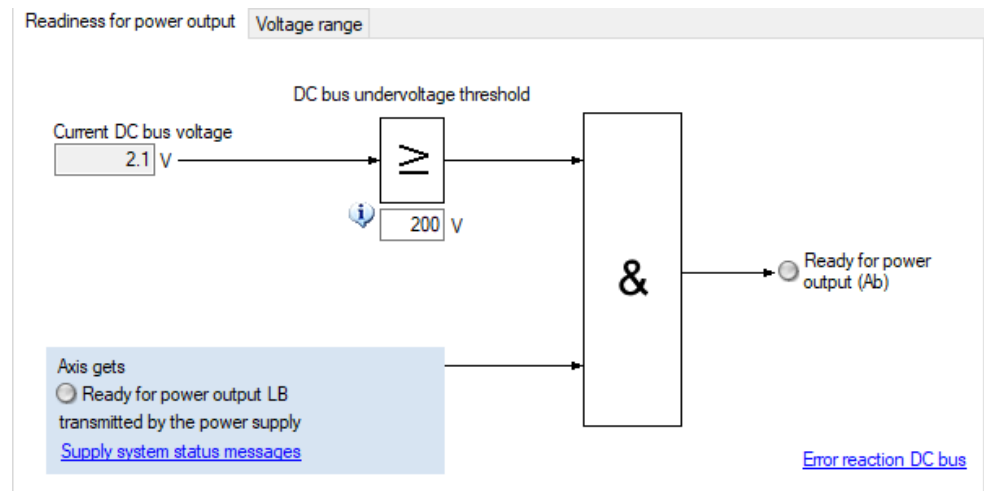


Fig. 14: DC bus voltage measurement (DC bus discharged)

Switching from "OPERATION_MODE" to target mode "MAINS_OFF" and DC bus charged

Now change the power supply mode from "OPERATION_MODE" to "MAINS_OFF" and DC bus charged and visualize the change in ctrlX DRIVE with ctrlX DRIVE Engineering.

To change the power supply mode via the function block, use the "TargetMode" tag. At the "TargetMode" tag, enter the value for "MAINS_OFF", whereupon the function block writes the corresponding data to the control word (S-0-1720.0.1).

Check the current state at the "ActualMode" output of the function block: "OPERATION_MODE" → "DC_POWER_OFF_NO_DISCHARGE" → "MAINS_OFF" and DC bus charged.

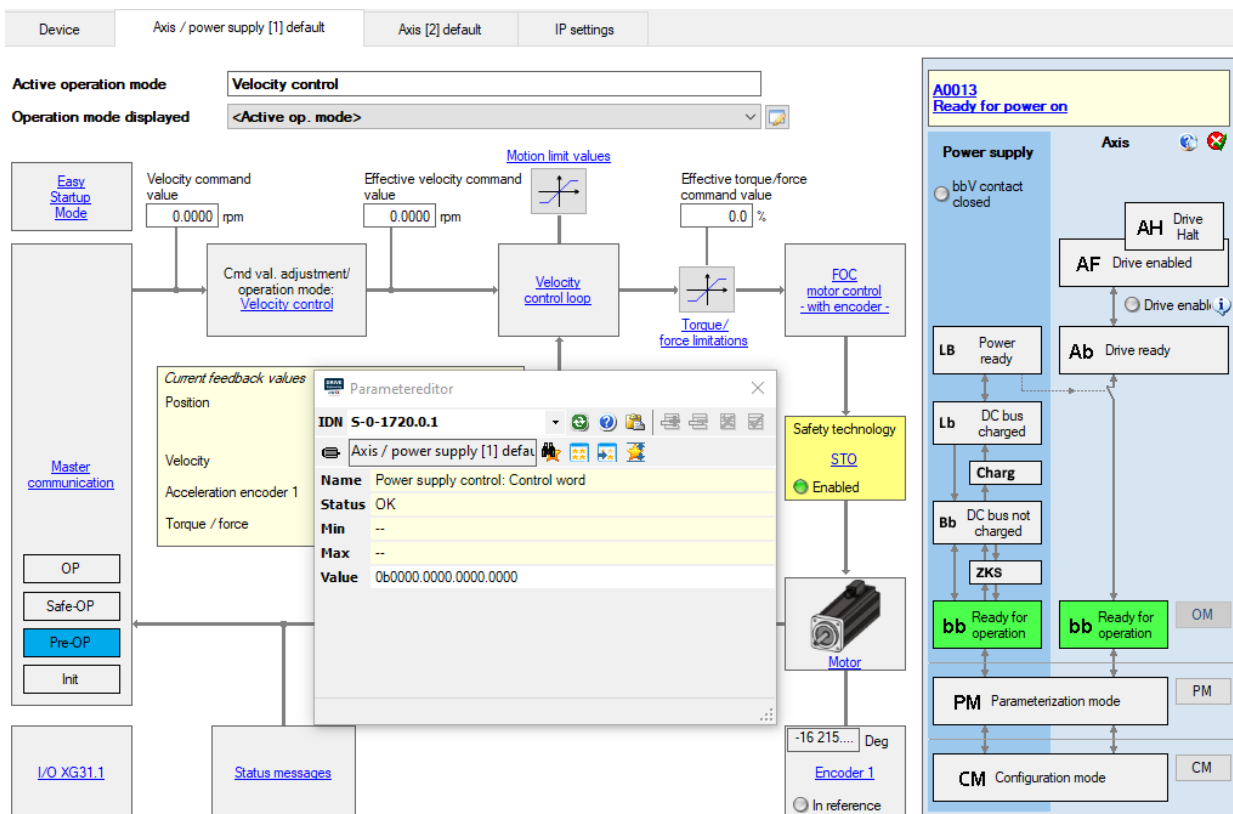


Fig. 15: Target mode "MAINS_OFF" and DC bus charged

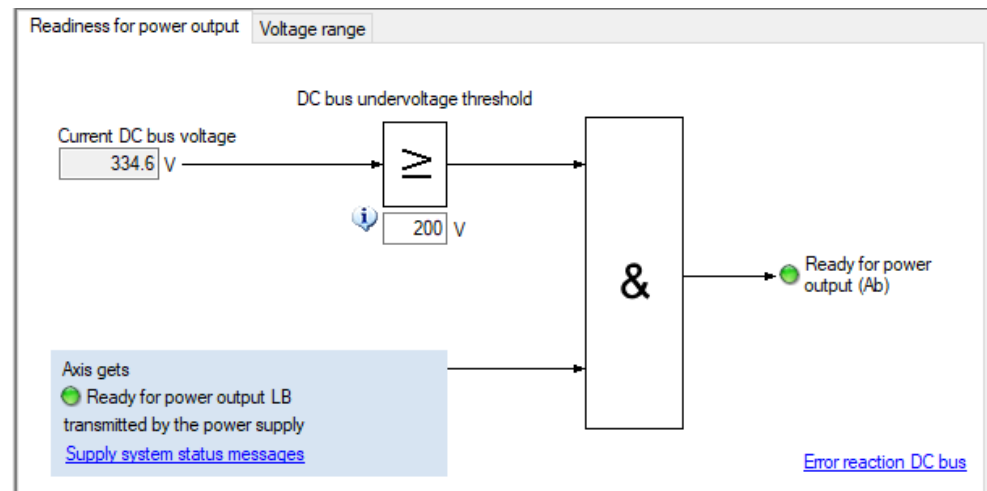


Fig. 16: DC bus voltage measurement (DC bus charged)

Switching from "OPERATION_MODE" to target mode "MAINS_OFF" and DC bus discharged

Now change the power supply mode from "OPERATION_MODE" to "MAINS_OFF" and DC bus discharged and visualize the change in ctrlX DRIVE with ctrlX DRIVE Engineering.

To change the power supply mode via the function block, use the "TargetMode" tag. At the "TargetMode" tag, enter the value for (MAINS_OFF_DISCHARGE), whereupon the function block writes the corresponding data to the control word (S-0-1720.0.1).

Check the current state at the "ActualMode" output of the function block: "OPERATION_MODE" → "DC_POWER_OFF_DISCHARGE" → "MAINS_OFF" and DC bus discharged.

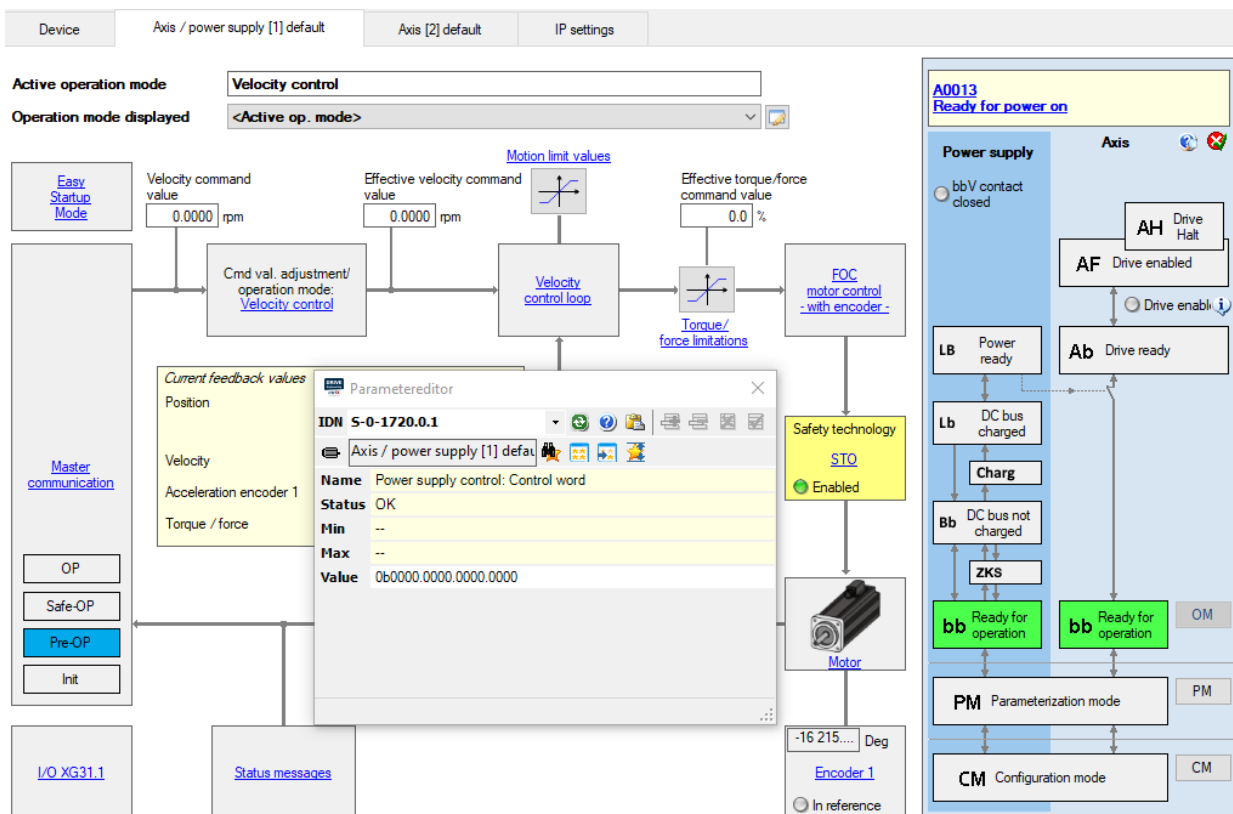


Fig. 17: Target mode "MAINS_OFF" and DC bus discharged

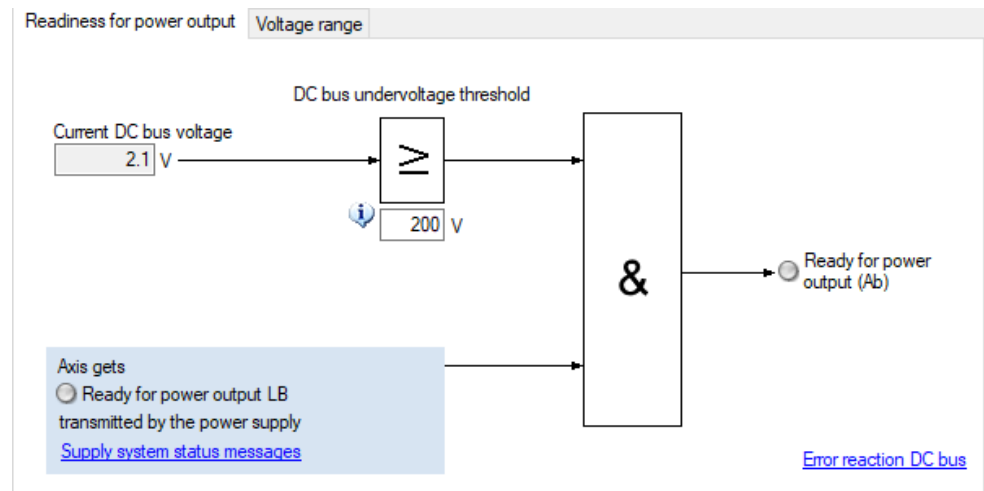


Fig. 18: DC bus voltage measurement (DC bus discharged)

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