ACOPOSinverter X64
ACOPOSinverter P64new

Migration manual

Version: **1.20 (December 2019)**
Order no.: **MAACPIX64-ENG**

Translation of the original documentation

1 Safety information

Read through these instructions carefully and familiarize yourself with the device before installing, operating or servicing it. The warning messages listed below are included in all documentation and on the device itself in order to highlight potential risks and hazards, or to indicate specific information intended to explain or simplify a particular procedure.

Notes

Danger!

DANGER indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

Warning!

WARNING indicates a potentially hazardous situation that, if not avoided, can result in death, serious injury and/or damage to the equipment.

Caution!

CAUTION indicates a potentially hazardous situation that, if not avoided, can result in injury and/or damage to the equipment.

Advice:

NOTE, when used without an accompanying hazard symbol, indicates a potentially hazardous situation that, if not avoided, could result in damage to the equipment.

Within the scope of this manual, the term "inverter" refers to the controller unit of the frequency inverter as defined by NEC.
Only qualified personnel are permitted to install, operate, service and repair electrical devices. B&R takes no responsibility for any consequences that may arise from use of this product.

PLEASE NOTE:

Only qualified personnel are permitted to install, operate, control and service electrical devices. B&R is not liable for any damages resulting from use of this equipment.
Qualified personnel are employees who have acquired the necessary skills and knowledge in relation to the design, operation and installation of these electrical devices, and who have successfully completed training on how to identify and prevent potential hazards.

Personnel qualifications

Only trained and authorized personnel who are familiar with the content of this manual as well as the overall product documentation are permitted to work with or near this product. In addition, such personnel must have taken part in safety training on the identification and prevention of potential hazards associated with use of this product. They must have received sufficient technical training, acquired relevant knowledge and experience and be capable of anticipating and identifying potential hazards resulting from use of the product, changes to its settings or from the mechanical, electrical and electronic features of the overall system. All personnel working with or near this product must be familiar with all applicable standards, guidelines and accident prevention guidelines.

Intended use

This product is an inverter for three-phase synchronous, reluctance and induction motors and is intended for industrial applications in line with the specifications and instructions contained in this manual. When using the product, all relevant safety precautions, guidelines, specified requirements and technical data must be observed. The product must be installed outside the ATEX zone. Before using the product, a risk assessment must be performed in relation to the product's planned application. Based on the results of this analysis, suitable safety procedures must

be implemented. Since the product is used as a component of an overall system, personal safety must be ensured by selecting an appropriate complete system variant (such as an appropriate machine design, for example). Use of this product in any way other than its expressly permitted use is strictly prohibited and can be potentially dangerous. Only qualified personnel are permitted to install, operate, control and service electrical devices.

Product-related information

Danger!

RISK OF ELECTRIC SHOCK, ARC FLASH OR EXPLOSION

- **Only suitably trained and authorized personnel who are familiar with the content of this manual as well as the overall product documentation are permitted to work with or near this drive system. Such personnel must also have successfully completed safety training on how to identify and prevent the various hazards involved. Installation, adjustment, repair and maintenance must be performed by qualified personnel.**
- **The system integrator is responsible for ensuring compliance with all relevant local and national electrical engineering requirements as well as with any other applicable regulations in relation to the protective grounding of all devices.**
- **Many product parts, including the printed circuits, are powered via the mains voltage.**
- **Only use electrically insulated tools and ensure that measuring instruments are used with the correct rated voltage.**
- **Once powered on, do not touch any unshielded components or terminals.**
- **Motors can generate voltage when the shaft rotates. Before working on the drive system, make sure that the motor shaft is not driven by an external source.**
- **If there is a change in voltage, the power supply to unused conductors in the motor cable can become disconnected. Any motor cable conductors that are not used must be insulated at either end.**
- **Do not short-circuit the DC bus terminals, the DC bus capacitors or the braking resistor terminals.**
- **Before performing any work on the drive system, proceed as follows:**
  - **Disconnect all power supplies, including the external power supply to the control unit, if applicable. Note that the circuit breaker or main power disconnect switch does not de-energize all circuits.**
  - **Affix a DO NOT SWITCH ON sign to all circuit breakers connected to the inverter system.**
  - **Lock all circuit breakers in the open position.**
  - **Wait 15 minutes to allow the DC bus capacitors to discharge.**
  - **Follow the instructions included in section "Testing for absence of voltage" of the product installation instructions.**
- **Before switching on the power supply to the inverter system, proceed as follows:**
  - **Make sure that all work is complete and that no hazards have been created as a result of the installation.**
  - **If the mains input terminals and motor output terminals are grounded and short-circuited, remove the grounding and short circuits from the main input terminals and motor output terminals.**
  - **Make sure that the entire device is grounded correctly.**
  - **Make sure that all protective equipment such as covers, doors and grids are installed and closed.**
- **Mount and close all covers before switching on the power supply.**

Failure to follow these instructions can result in death or serious injury.

Incorrect settings, invalid data or faulty wiring as well as other types of error can cause unexpected movements.

Warning!

UNINTENDED OPERATION OF THE EQUIPMENT

- **When wiring the device, all EMC requirements must be strictly observed.**
- **It is not permitted to operate the product using unspecified or unsuitable settings or data.**
- **Perform a comprehensive commissioning test.**

Failure to follow these instructions can result in serious injury or death as well as damage to the equipment.

Damaged products and accessories can result in electric shock or the equipment operating in unanticipated ways.

Danger!

ELECTRIC SHOCK OR UNEXPECTED OPERATION OF THE EQUIPMENT

Use of damaged products or accessories is not permitted.

Failure to follow these instructions can result in death or serious injury.

In the event of damage, contact your local B&R sales representative.

Warning!

LOSS OF CONTROL

- **When designing a control plan, possible error states for the control paths must be taken into account and for certain critical control functions, a procedure must be put in place to ensure that the device can return to a safe state after a path has failed. Examples of critical control functions include emergency switch-off, overrun stop, power failure and restart.**
- **Separate or redundant control paths must be provided for critical control functions.**
- **System control paths can include communication connections. The effects of unforeseen transfer delays or connection disruptions must be taken into account.**
- **All applicable accident prevention guidelines and local safety regulations[1] must be taken into account.**
- **Before commissioning, each individual implementation of the product must be tested carefully to ensure smooth operation.**

Failure to follow these instructions can result in serious injury or death as well as damage to the equipment.

Advice:

IRREPARABLE DAMAGE DUE TO INCORRECT SUPPLY VOLTAGE

- **Before switching on and configuring the product, ensure that it is authorized for use with the existing supply voltage.**

Failure to follow these instructions can result in equipment damage or injury.

When operating, the products described in these instructions can reach temperatures of over 80°C.

Warning!

HOT SURFACES

- **Avoid all contact with hot surfaces.**
- **Keep flammable or heat-sensitive parts away from the immediate vicinity of hot surfaces.**
- **Before handling the product, make sure to check that it has cooled down sufficiently.**
- **Make sure that there is adequate heat dissipation by performing a test run on maximum load.**

Failure to follow these instructions can result in serious injury or death as well as damage to the equipment.

The product is approved for applications in areas outside of danger zones (explosive atmospheres). Only install the device in zones that are not exposed to hazardous environments.

[1] For additional information for the US, see NEMA ICS 1.1 (latest edition), "Safety guidelines for the application, installation and maintenance of solid-state control" and NEMA ICS 7.1 (latest edition), "Safety standards for construction and guide for selection, installation and operation of adjustable-speed drive systems".

Danger!

EXPLOSION HAZARD

Install and use this device only outside of danger zones.

Failure to follow these instructions will result in death or serious injury.

Machines, controllers and associated devices are usually integrated into the network. Unauthorized persons and malware can gain access to the machine or other devices on the machine's network/fieldbus and connected networks via insufficiently secured access to software and networks.

Warning!

UNAUTHORIZED ACCESS TO THE MACHINE VIA SOFTWARE OR NETWORK

In your hazard and risk analysis, take into account all dangers that may arise by accessing and operating the network/fieldbus and develop a suitable cybersecurity concept.

Ensure that the hardware and software infrastructure into which the machine will be integrated, as well as the organizational measures and policies, cover access to this infrastructure by taking into account the results of the hazard and risk analysis, that they are implemented according to best practices and standards and that they address IT and cybersecurity concerns (e.g. ISO/IEC 27000 for common criteria for assessing the security of information technology systems, ISO/IEC 15408, IEC 62351, ISA/IEC 62443, NIST cybersecurity framework, Information Security Forum - "Standard of good practice for information security").

Ensure the effectiveness of your IT and cybersecurity system by using appropriate, proven methods.

Failure to follow these instructions can result in death, serious injury or damage to property.

Warning!

LOSS OF CONTROL

Perform a comprehensive commissioning check to ensure that the communication monitoring system correctly detects communication interruptions.

Failure to follow these instructions can result in death, serious injury or damage to property.

2 General information

The ACOPOSinverter P64new is available as a replacement product for the discontinued X64 to ensure replacement part availability for old systems and retrofits. This way, we make it possible for users to deploy their machine generations on the market as long as possible.

The P64new is physically based on the ACOPOSinverter P66. A specific communication card is used to establish software compatibility with the X64. Both products are used with hardware upgrade "8I64xxxxxxx.00x-1".

This document lists the differences between the two frequency inverter series that must be taken into account during product migration.

Advice:

ACOPOSinverter P66 is the successor product of ACOPOSinverter X64 and must be used for new systems or for new projects in Automation Studio.

ACOPOSinverter X64

ACOPOSinverter P64new

Comparison of order numbers:

ACOPOSinverter X64	ACOPOSinverter P64new
1-phase 200 to 240 VAC	
8I64S200018.00X-1	8I64S200018.0X-000
8I64S200037.00X-1	8I64S200037.0X-000
8I64S200055.00X-1	8I64S200055.0X-000
8I64S200075.00X-1	8I64S200075.0X-000
8I64S200110.00X-1	8I64S200110.0X-000
8I64S200150.00X-1	8I64S200150.0X-000
8I64S200220.00X-1	8I64S200220.0X-000
3-phase 200 to 240 VAC	
8I64T200018.00X-1	8I64T200018.0X-000
8I64T200037.00X-1	8I64T200037.0X-000
8I64T200055.00X-1	8I64T200055.0X-000
8I64T200075.00X-1	8I64T200075.0X-000
8I64T200110.00X-1	8I64T200110.0X-000
8I64T200150.00X-1	8I64T200150.0X-000
8I64T200220.00X-1	8I64T200220.0X-000
8I64T200300.00X-1	8I64T200300.0X-000
8I64T200400.00X-1	8I64T200400.0X-000
8I64T200550.00X-1	8I64T200550.0X-000
8I64T200750.00X-1	8I64T200750.0X-000
8I64T201100.00X-1	8I64T201100.0X-000
8I64T201500.00X-1	8I64T201500.0X-000
3-phase 380 to 500 VAC	
8I64T400037.00X-1	8I64T400037.0X-000
8I64T400055.00X-1	8I64T400055.0X-000
8I64T400075.00X-1	8I64T400075.0X-000
8I64T400110.00X-1	8I64T400110.0X-000
8I64T400150.00X-1	8I64T400150.0X-000
8I64T400220.00X-1	8I64T400220.0X-000
8I64T400300.00X-1	8I64T400300.0X-000

ACOPOSinverter X64	ACOPOSinverter P64new
8I64T400400.00X-1	8I64T400400.0X-000
8I64T400550.00X-1	8I64T400550.0X-000
8I64T400750.00X-1	8I64T400750.0X-000
8I64T401100.00X-1	8I64T401100.0X-000
8I64T401500.00X-1	8I64T401500.0X-000

Advice:

The ACOPOSinverter P64new is a largely compatible solution for existing B&R customers and not a further development of the ACOPOSinverter X64. Additional functions of the new drive (e.g. safety applications) are not enabled.

3 Installation

When installing the ACOPOSinverter P64new, it is important to note that the dimensions will change slightly compared to the original product. In addition, the wiring of the low voltage I/Os and motor cable must be adapted to the replacement product, if necessary.

3.1 Dimensions and drill hole patterns

The following deviations with regard to mechanical data must be observed:

Material number ACOPOSinverter P66	Variant	ACOPOSinverter P66 / ACOPOSinverter P64new					ACOPOSinverter X64			
		Weight [kg]	Width [mm]	Height [mm]	Depth [mm]	Height including shield plate [mm]	Weight [kg]	Width [mm]	Height [mm]	Depth [mm]
8I66S200018.00-000	1-phase - 200 to 240 V - 0.18 kW	0.8	72	143	109	188	0.9	72	145	128
8I66S200037.00-000	1-phase - 200 to 240 V - 0.37 kW	1	72	143	128	188	0.9	72	145	128
8I66S200055.00-000	1-phase - 200 to 240 V - 0.55 kW	1.1	72	143	138	188	0.9	72	145	138
8I66S200075.00-000	1-phase - 200 to 240 V - 0.75 kW	1.1	72	143	138	188	0.9	72	145	138
8I66S200110.00-000	1-phase - 200 to 240 V - 1.1 kW	1.6	105	142	158	188	1.25	105	143	138
8I66S200150.00-000	1-phase - 200 to 240 V - 1.5 kW	1.6	105	142	158	188	1.35	107	143	158
8I66S200220.00-000	1-phase - 200 to 240 V - 2.2 kW	1.6	105	142	158	188	1.35	107	143	158
8I66T200018.00-000	3-phase - 200 to 240 V - 0.18 kW	0.8	72	143	109	188	0.9	72	145	122
8I66T200037.00-000	3-phase - 200 to 240 V - 0.37 kW	0.8	72	143	128	188	0.9	72	145	122
8I66T200055.00-000	3-phase - 200 to 240 V - 0.55 kW	1	72	143	138	188	0.9	72	145	132
8I66T200075.00-000	3-phase - 200 to 240 V - 0.75 kW	1	72	143	138	188	0.9	72	145	132
8I66T200110.00-000	3-phase - 200 to 240 V - 1.1 kW	1.4	105	143	138	190	1.25	105	143	132
8I66T200150.00-000	3-phase - 200 to 240 V - 1.5 kW	1.4	105	143	138	190	1.25	105	143	132
8I66T200220.00-000	3-phase - 200 to 240 V - 2.2 kW	1.4	105	143	138	190	1.35	107	143	152
8I66T200300.00-000	3-phase - 200 to 240 V - 3 kW	2.2	140	184	158	228	2.35	142	184	152
8I66T200400.00-000	3-phase - 200 to 240 V - 4 kW	2.2	140	184	158	228	2.35	142	184	152
8I66T200550.00-000	3-phase - 200 to 240 V - 5.5 kW	3.5	150	232	178	308	4.7	180	232	172
8I66T200750.00-000	3-phase - 200 to 240 V - 7.5 kW	3.6	150	232	178	308	4.7	180	232	172
8I66T201100.00-000	3-phase - 200 to 240 V - 11 kW	6.8	180	330	198	405	9	245	329.5	192
8I66T201500.00-000	3-phase - 200 to 240 V - 15 kW	6.9	180	330	198	405	9	245	329.5	192
8I66T400037.00-000	3-phase - 380 to 500 V - 0.37 kW	1.2	105	142	158	188	1.35	107	143	158
8I66T400055.00-000	3-phase - 380 to 500 V - 0.55 kW	1.2	105	142	158	188	1.35	107	143	158
8I66T400075.00-000	3-phase - 380 to 500 V - 0.75 kW	1.2	105	142	158	188	1.35	107	143	158
8I66T400110.00-000	3-phase - 380 to 500 V - 1.1 kW	1.3	105	142	158	188	1.35	107	143	158
8I66T400150.00-000	3-phase - 380 to 500 V - 1.5 kW	1.3	105	142	158	188	1.35	107	143	158
8I66T400220.00-000	3-phase - 380 to 500 V - 2.2 kW	2.1	140	184	158	228	2.35	142	184	158
8I66T400300.00-000	3-phase - 380 to 500 V - 3 kW	2.1	140	184	158	228	2.35	142	184	158
8I66T400400.00-000	3-phase - 380 to 500 V - 4 kW	2.2	140	184	158	228	2.35	142	184	158
8I66T400550.00-000	3-phase - 380 to 500 V - 5.5 kW	3.5	150	232	178	308	2.35	142	184	158
8I66T400750.00-000	3-phase - 380 to 500 V - 7.5 kW	3.5	150	232	178	308	2.35	142	184	158
8I66T401100.00-000	3-phase - 380 to 500 V - 11 kW	6.5	180	330	198	404	2.35	142	184	158
8I66T401500.00-000	3-phase - 380 to 500 V - 15 kW	6.5	180	330	198	404	2.35	142	184	158

Material number ACOPOSinverter P66	Variant	ACOPOSinverter P66 / ACOPOSinverter P64new		ACOPOSinverter X64	
		Drill hole pattern width [mm]	Drill hole pattern height [mm]	Drill hole pattern width [mm]	Drill hole pattern height [mm]
8I66S200018.00-000	1-phase - 200 to 240 V - 0.18 kW	60	131	60	121.5
8I66S200037.00-000	1-phase - 200 to 240 V - 0.37 kW	60	121.5	60	121.5
8I66S200055.00-000	1-phase - 200 to 240 V - 0.55 kW	60	121.5	60	121.5
8I66T400075.00-000	1-phase - 200 to 240 V - 0.75 kW	60	121.5	60	121.5
8I66S200110.00-000	1-phase - 200 to 240 V - 1.1 kW	93	118	93	121.5
8I66S200150.00-000	1-phase - 200 to 240 V - 1.5 kW	93	118	93	121.5
8I66S200220.00-000	1-phase - 200 to 240 V - 2.2 kW	93	118	93	121.5
8I66T200018.00-000	3-phase - 200 to 240 V - 0.18 kW	60	131	60	121.5
8I66T200037.00-000	3-phase - 200 to 240 V - 0.37 kW	60	121.5	60	121.5
8I66T200055.00-000	3-phase - 200 to 240 V - 0.55 kW	60	121.5	60	121.5
8I66T200075.00-000	3-phase - 200 to 240 V - 0.75 kW	60	121.5	60	121.5
8I66T200110.00-000	3-phase - 200 to 240 V - 1.1 kW	93	118	93	121.5
8I66T200150.00-000	3-phase - 200 to 240 V - 1.5 kW	93	118	93	121.5
8I66T200220.00-000	3-phase - 200 to 240 V - 2.2 kW	93	118	93	121.5
8I66T200300.00-000	3-phase - 200 to 240 V - 3 kW	126	157	126	157
8I66T200400.00-000	3-phase - 200 to 240 V - 4 kW	126	157	126	157
8I66T200550.00-000	3-phase - 200 to 240 V - 5.5 kW	130	210	160	210
8I66T200750.00-000	3-phase - 200 to 240 V - 7.5 kW	130	210	160	210
8I66T201100.00-000	3-phase - 200 to 240 V - 11 kW	160	295	225	295
8I66T201500.00-000	3-phase - 200 to 240 V - 15 kW	160	295	225	295
8I66T400037.00-000	3-phase - 380 to 500 V - 0.37 kW	93	118	93	121.5
8I66T400055.00-000	3-phase - 380 to 500 V - 0.55 kW	93	118	93	121.5
8I66T400075.00-000	3-phase - 380 to 500 V - 0.75 kW	93	118	93	121.5
8I66T400110.00-000	3-phase - 380 to 500 V - 1.1 kW	93	118	93	121.5
8I66T400150.00-000	3-phase - 380 to 500 V - 1.5 kW	93	118	93	121.5
8I66T400220.00-000	3-phase - 380 to 500 V - 2.2 kW	126	157	126	157
8I66T400300.00-000	3-phase - 380 to 500 V - 3 kW	126	157	126	157
8I66T400400.00-000	3-phase - 380 to 500 V - 4 kW	126	157	126	157
8I66T400550.00-000	3-phase - 380 to 500 V - 5.5 kW	130	210	160	210
8I66T400750.00-000	3-phase - 380 to 500 V - 7.5 kW	130	210	160	210
8I66T401100.00-000	3-phase - 380 to 500 V - 11 kW	160	295	225	295
8I66T401500.00-000	3-phase - 380 to 500 V - 15 kW	160	295	225	295

3.2 Input and output circuit diagram

The ACOPOSinverter P64new provides the following I/Os:

- 2x relays "R1", "R2"
- 1x digital output "DQ1", "DQ" for short
- 6x digital inputs "DI1", "DI2", "DI3", "DI4", "DI5", "DI6"
- 1x analog output "AQ1", "AQ" for short
- 3x analog inputs "AI1", "AI2", "AI3"

This makes it possible to numerically represent all I/Os that were offered by the ACOPOSinverter X64:

- 1x relay "R2"
- 1x digital output "DO1", "DO" for short
- 4x digital inputs "LI1", "LI2", "LI3", "LI4"
- 1x analog output "AO1", "AO" for short
- 3x analog inputs "AI1", "AI2", "AI3"

The I/Os on the ACOPOSinverter P64new are managed by the drive. Since the supplier does not guarantee the real-time capability of its firmware, there are limitations in use. Preprocessing incoming signals (e.g. edge counting or AB-counter) is no longer possible, for example.
If this function is implemented on the ACOPOSinverter X64, an additional X20 module must be implemented during the upgrade, if necessary.

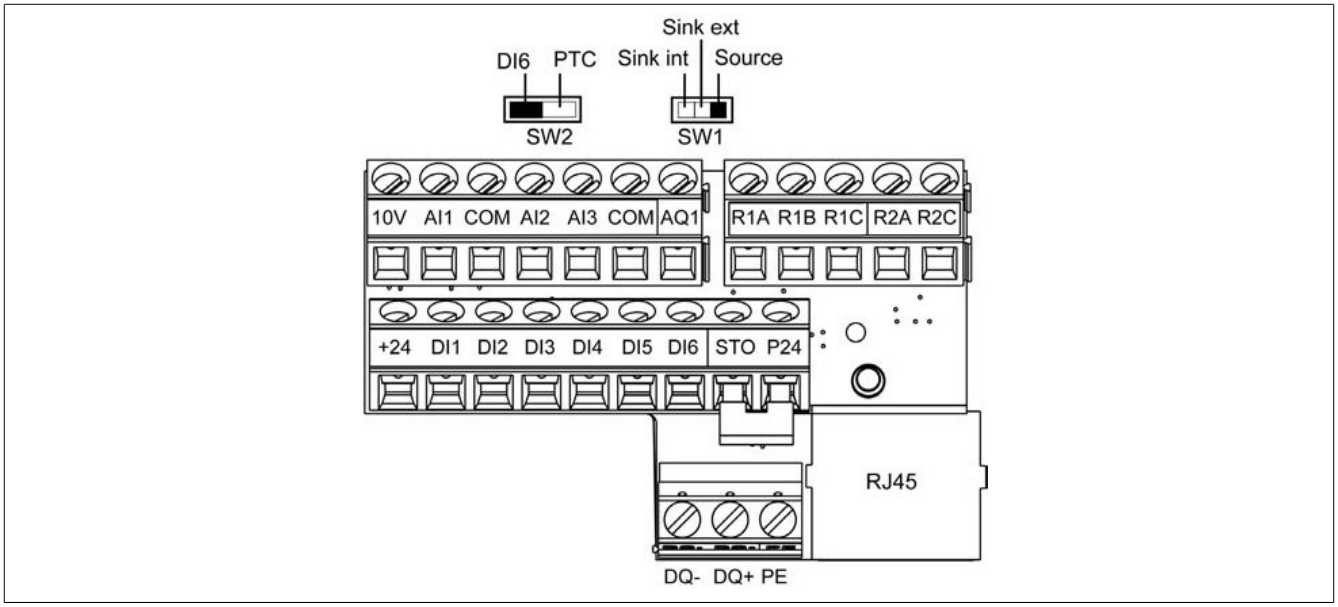
The digital output

The ACOPOSinverter P64new provides a digital output. In contrast to the original product, however, this is a floating output, i.e. DQ- must be supplied with the desired voltage in order to implement a comparable switching process for DQ+.

Notice!

When migrating DO (ACOPOSinverter X64) to DQ (ACOPOSinverter P64new), it is important to ensure that the maximum load capacity of output DQ (ACOPOSinverter P64new) is not exceeded.

3.2.1 Inputs and outputs



Characteristics of the terminals

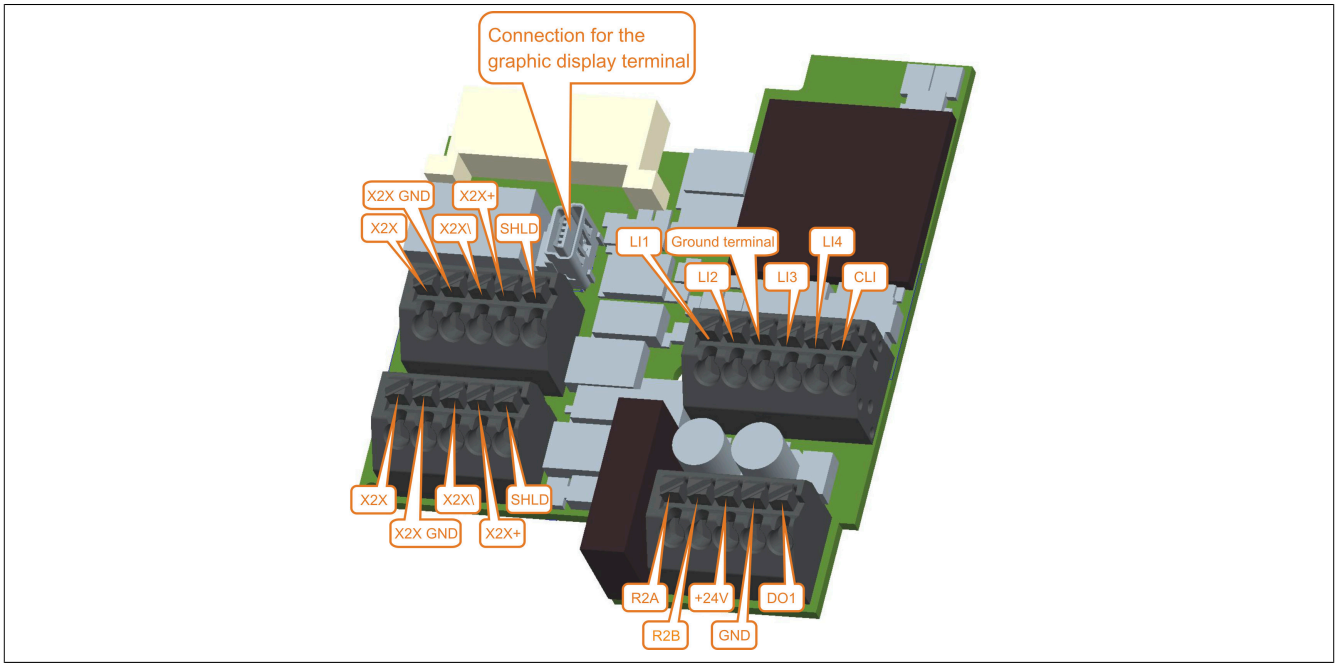
Advice:

- **For a description of the terminal arrangement, see the section on the arrangement and characteristics of the control terminals as well as communication and I/O ports.**
- **For more information about the factory pre-set I/O assignment, see section "Programming".**

Terminal	Description	I/O type	Electrical characteristics
10 V	Power supply for setpoint potentiometer	Output	Internal power supply for analog inputs • 10 VDC • Tolerance: 0 to 10% • Current: Max. 10 mA
AI1	Analog voltage input	Input	Analog input 0 + 10 VDC • Impedance: 30 kΩ • Resolution: 10-bit converter • Accuracy: ° ±0.5% at 25°C (77°F) ° ±0.7% at a temperature fluctuation of 60°C (108°F) • Linearity: ±0.2% (max. ±0.5%) of maximum value • Sampling time: 2 ms
COM	Reference wire for analog inputs and outputs	Input/Output	0 V
AI2	Analog voltage input	Input	Bipolar analog input 0 ±10 VDC (max. voltage ±30 VDC). The + or - polarity of the voltage at AI2 influences the setpoint direction, and therefore the rotation direction. • Impedance: 30 kΩ • Resolution: 10 bits • Accuracy: ° ±0.5% at 25°C (77°F) ° ±0.7% at a temperature fluctuation of 60°C (108°F) • Linearity: ±0.2% (max. ±0.5%) of maximum value • Sampling time: 2 ms
AI3	Analog current input	Input	Analog input 0 to 20 mA (or 4 to 20 mA, X to 20 mA, 20 to Y mA). X and Y can be programmed to values between 0 and 20 mA. • Impedance: 250 Ω • Resolution: 10 bits • Accuracy: ° ±0.5% at 25°C (77°F) ° ±0.7% at a temperature fluctuation of 60°C (108°F) • Linearity: ±0.2% (max. ±0.5%) of maximum value • Sampling time: 2 ms
COM	Reference wire for analog inputs and outputs	Input/Output	0 V
AQ1	Analog output	Output	AQ: Analog output configurable via software for voltage or current • Analog voltage output: 0 to 10 VDC. Minimum load impedance: 470 Ω • Analog current output X-Y mA by programing X and Y to between 0 and 20 mA, maximum load impedance: 800 Ω • Sampling time: 2 ms • Resolution: 10 bits • Accuracy: ° ±1% for 25°C ±10°C (77°F) ° ±2% at a temperature fluctuation of 60°C (108°F) • Linearity: ±0.3%
R1A	Normally open (NO) contact for relay R1	Output	Output relay 1 • Minimum switching capacity: 5 mA for 24 VDC • Maximum switching current for resistive load: 3 A for 250 VAC (OVC II) 30 VDC • Maximum switching current for inductive load: 2 A for 250 VAC (OVC II) and 30 VDC. The inductive load must be equipped with a device for suppressing voltage peaks in AC or DC operation, the total energy loss of which is greater than the inductive energy stored in the load. • Update time: 2 ms • Service life: 100,000 switching operations at maximum switching current
R1B	Normally closed (NC) contact for relay R1	Output	
R1C	Contact reference point for relay R1	Output	
R2A R2C	Normally open (NO) contact for programmable relay R2	Output	Output relay 2 • Minimum switching capacity: 5 mA for 24 VDC • Maximum switching current for resistive load: 5 A for 250 VAC (OVC II) and 30 VDC • Maximum switching current for inductive load: 2 A for 250 VAC (OVC II) and 30 VDC. The inductive load must be equipped with a device for suppressing voltage peaks in AC or DC operation, the total energy loss of which is greater than the inductive energy stored in the load. • Update time: 2 ms • Service life: ° 100,000 switching operations at maximum switching capacity ° 1,000,000 switching operations at 1 A
+24	Power supply for digital inputs and outputs	Output	• Input delay 24 VDC • Tolerance: -15 to 20% • Current: 100 mA
DI1	Digital inputs	Input	4 programmable digital inputs, configurable as sink or source via switch SW1

Terminal	Description	I/O type	Electrical characteristics
DI2 DI3 DI4			• 24 VDC power supply (max. 30 VDC) • State 0 if <5 VDC, state 1 if >11 VDC (in source mode) • State 0 if >16 VDC, state 1 if <10 VDC (in sink mode) • Response time: 8 ms on stop
DI5 DI6	Digital inputs	Input	When programming as digital inputs, the characteristics are the same as for DI1 to DI4. • DI5 can be programmed as a pulse input based on 20 kpps (pulses per second). • DI6 can be used as a PTC (Positive Temperature Coefficient) via switch SW2. • Threshold value for resolution: 3 kΩ, threshold value for reset: 1.8 kΩ • Threshold value for short-circuit detection <50 Ω
STO	Input STO (Safe Torque Off)	Input	• Input: 24 VDC • Impedance: 1.5 kΩ
P24	Power supply for STO input and input for optional external power supply (additional fuse required)	Input/Output	• 24 VDC • Tolerance: -15 to 20% • Current: Max. 1.1 A
DQ- DQ+	Digital output	Output	Output with open collector, configurable as sink or source via switch SW1 • Update time: 2 ms • Maximum voltage: 30 VDC • Maximum current: 100 mA
PE	Protective ground	-	ACOPOSinverter P66 protective ground for high-speed communication.

3.2.2 ACOPOSinverter X64



Terminal	Function	Electrical characteristics
R2A R2C	NO contact of programmable relay r2	• Minimum switching capacity: 10 mA at 5 V (DC power) • Max. switching capacity at resistive load (cos ϕ = 1 and L/R = 0 ms): 2 A at 250 V (AC power) and 30 V (DC power) • Max. switching capacity at inductive load (cos ϕ = 0.4 and L/R = 7 ms): 1.5 A at 250 V (AC power) and 30 V (DC power) • Sampling time: 8 ms • Service life: 100,000 switching operations at maximum switching capacity
+24 V	Power supply for X2X interface	MANDATORY • 24 VDC (min. 18 V, max. 30 V) • Power: 1.6 W at 24 VDC
GND	Common	GND for 24 VDC power supply
DO1	Digital output	• Switching voltage: 18 to 30 VDC • Diagnostic status: Output monitoring with 100 µs delay • Leakage current when the power is switched off: 3 µA • Residual voltage: <0.3 V at 0.5 A nominal current • Short-circuit peak current: <35 A • Switch-on after overload or short-circuit shutdown: <20 µs • Switching delay: – 0 → 1: <100 µs – 1 → 0: <300 µs • Switching frequency at resistive load: Max. 100 Hz • Output circuit: Source X2X data point
LI1 LI2	Logic inputs	• Power supply 24 V (max. 30 V) • Impedance: 12.1 kΩ • State 0 if <5 V, state 1 if >15 V (voltage difference between LI- and CLI) • Sampling time: 4 ms
⏚	Ground terminal	Recommended wire cross section 1.5 mm² (16 AWG). The ground terminal must be connected to the EMC plate.

Terminal	Function	Electrical characteristics
LI3 LI4	Depending on the I/O configuration, LI3 and LI4 can be used as: • Logic inputs or • Counter inputs	Same characteristics as LI1 and LI2 Event counter, gate, frequency and period measurement (LI3 and LI4 cannot be used for library ACP10SDC. Operation as event counter: • Counter size: 32-bit • Max. input frequency: 100 kHz Gate measurement: • Counter size: 32-bit (16-bit with active overflow detection) • Max. input frequency: 100 kHz • Counter frequency: 4 MHz or 31.25 kHz internal, max. 100 kHz external • Max. discrepancy at 24 V: ±4 µs Period measurement • Counter size: 32-bit (16-bit with active overflow detection) • Max. input frequency: 100 kHz • Counter frequency: 4 MHz or 31.25 kHz internal, max. 100 kHz external Operation as AB counter: • Counter size: 32-bit • Max. input frequency: 20 kHz X2X data point
CLI	Reference conductor for logic inputs	Source: Connect CLI to 24 VDC Sink: Connect CLI to GND LI3 and LI4 in counter operation only possible with sink connection
X2X X2X GND X2X\ SHLD	X2X input	
X2X X2X GND X2X\ SHLD	X2X output	
X2X+		X2X+ not used (internally connected between X2X+ input and X2X+ output)
USB connection	Connection for the graphic display terminal	

Advice:

- **Under hardware revision B5, the maximum counter input frequency is 5 kHz.**
- **Under hardware revision B0, the counter inputs are changed. Counter 01 (LI3) and counter 02 (LI4).**

4 Interfaces

4.1 X2X Link

4.1.1 General information

This product is a plug-in interface for the ACOPOSinverter P64new. The communication card enables access to the drive parameters via the X2X Link bus. It was equipped with a special compatibility layer to convert controller access to the ACOPOSinverter X64 and prepare it for the ACOPOSinverter P64new. One input and one output have each been implemented for X2X Link. A shield connection and shield grounding are provided.

- Automatic firmware update via AS
- Power supply of interface card via inverter
- Electrical isolation between fieldbus and X2X Link
- Requires freely pre-assembled X2X cable

4.1.2 Order data

Model number	Short description	Figure
	Interface modules	
8I0IF109.400-2	Interface module for ACOPOSinverter P64new, 2x X2X Link interface	
	Optional accessories	
	Terminal blocks	
8TB2104.2010-00	4-pin screw clamp, single row, spacing: 5.08 mm, label 1: numbered serially	
8TB2104.2210-00	Push-in terminal block 4-pin, 1-row, spacing: 5.08 mm, label 1: numbered consecutively	
8TB2108.2010-00	8-pin screw clamp, single row, spacing: 5.08 mm, label 1: numbered serially	
8TB2108.2210-00	Push-in terminal block 8-pin, 1-row, spacing: 5.08 mm, label 1: numbered consecutively	

Table 1: 8I0IF109.400-2 - Order data

4.1.3 Technical data

Model number	8I0IF109.400-2
Short description	
Bus receiver	X2X Link bus receiver
General information	
B&R ID code	0xB0E4
Status indicators	Operating state, module status
Diagnostics	
Module run/error	Yes, using LED status indicator and software
Overload	Yes, using LED status indicator and software
Power consumption	
External I/O	500 mW
Additional power dissipation caused by actuators (resistive) [W]	-
Electrical isolation	
X2X Link - Frequency inverter	Yes
Certifications	
CE	Yes
UL	UL E225616 Power conversion equipment
CSA	Not relevant
Operating conditions	
Mounting orientation	
Vertical	Yes
Installation elevation above sea level	
0 to 2000 m	No limitation
>2000 m	Reduction of ambient temperature by 0.5°C per 100 m
Degree of protection per EN 60529	IP20

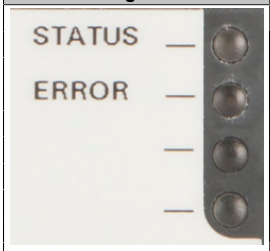
Table 2: 8I0IF109.400-2 - Technical data

Model number	8I0IF109.400-2
Ambient conditions	
Temperature	
Operation	-10 to 60°C
Storage	-40 to 85°C
Transport	-40 to 85°C
Relative humidity	
Operation	5 to 95%, non-condensing
Storage	5 to 95%, non-condensing
Transport	5 to 95%, non-condensing
Mechanical properties	
Note	Terminal blocks must be ordered separately. 2x 8TB2104.2010-00 (corresponds to 0TB704.9) or 2x 8TB2104.2210-00 (corresponds to 0TB704.91) or 1x 8TB2108.2010-00 or 1x 8TB2108.2210-00

Table 2: 8I0IF109.400-2 - Technical data

4.1.4 LED status indicators

For a description of different operating modes, see section "Additional information - Diagnostic LEDs" of the X20 system user's manual.

Figure	LED	Color	Status	Description
	STATUS	Green	Off	No power to module
			Single flash	Mode RESET[1)]
			Double flash	Mode BOOT[1)] (during firmware update)
			Blinking	Mode PREOPERATIONAL[1)]
			On	Mode RUN[1)]
	ERROR	Red	Off	Module not supplied with power or everything OK
			Single flash	Cyclic data scanner on frequency inverter not running
			Double flash	Power supply below the warning level of 20.4 V
			Triple flash	No communication with the frequency inverter
	STATUS + ERROR	Solid red / Single green flash		Invalid firmware

1) The operating states are described in Automation Help under "Real-time operating system - Method of operation - Operating states".

4.1.5 Pinout

Figure	Terminal	Description
	1	X2X
	2	GND
	3	X2X\
	4	Shield
	5	X2X
	6	GND
	7	X2X\
	8	Shield

5 Implementation

5.1 Distinction

The ACOPOSinverter P64new was developed to enable the continuous use of as many existing projects as possible. If the application-based differences do not require any adjustments in the project, the ACOPOSinverter P64new can be used as a 1-to-1 replacement. For this reason, both products report the same "ModuleID".

If it is necessary to make adjustments to the project, the value of "HardwareVariant" can be used to determine via the I/O mapping whether the ACOPOSinverter X64 or the ACOPOSinverter P64new is currently being controlled.

- The ACOPOSinverter X64 displays values lower than 10.
- The ACOPOSinverter P64new displays values greater than or equal to 10.

5.2 Device configuration at runtime

Some projects do not use the device configuration offered in Automaton Studio. In these cases the user-defined parameter set is often downloaded completely at runtime.

The download sequence recommended so far consisted of three steps:

1) Resetting the parameter set
2) Downloading the user-defined parameters
3) Saving the adjusted parameter set in EEPROM

If this sequence is implemented in the existing project, command for resetting parameter set "Reset to default" must be extended (see "Resetting the parameter set (control word "CMI")" on page 32).

5.3 Control behavior

Parameter **[U/F mot 1 selected]** (UFt) can still be set in the module configuration (Automation Studio). Since the configuration parameter on the ACOPOSinverter P64new is no longer available, the user-defined value is converted and written to parameter **[Motor control type]**(Ctt).

The conversion is made in accordance with the following mapping table:

Parameter [U/F mot 1 selected] (UFT) (ACOPOSinverter X64)	Parameter [Motor control type](Ctt) (ACOPOSinverter P64new)
[SVC] (n)	[SVC V] (UUC)
[Cst. Torque] (L)	[Standard] (Std)
[Var. Torque] (P)	[V/F Quad.] (UFq)
[Energy Sav.] (nLd)	[Energy Sav.] (nLd)

5.3.1 General evaluation

The return values are generated at a much higher sampling rate on the ACOPOSinverter P64new:

- LCR: The filter time for generating the current measurement values is 3.2 ms.
- RFRD: The filter time for generating the speed values is 6.4 ms.

The measurement dynamics of the ACOPOSinverter P64new were not adjusted because the higher sampling rate was considered an advantage.

The speed control algorithms differ slightly. In rare cases, the axis behavior may deviate noticeably. In order to illustrate this, a test project was created and evaluated.

The step responses of the internally measured current, the internally calculated speed and the directly measured change in position (measured with an ABR encoder) were randomly recorded for the ACOPOSinverter X64 and compared with those of the ACOPOSinverter P64new.

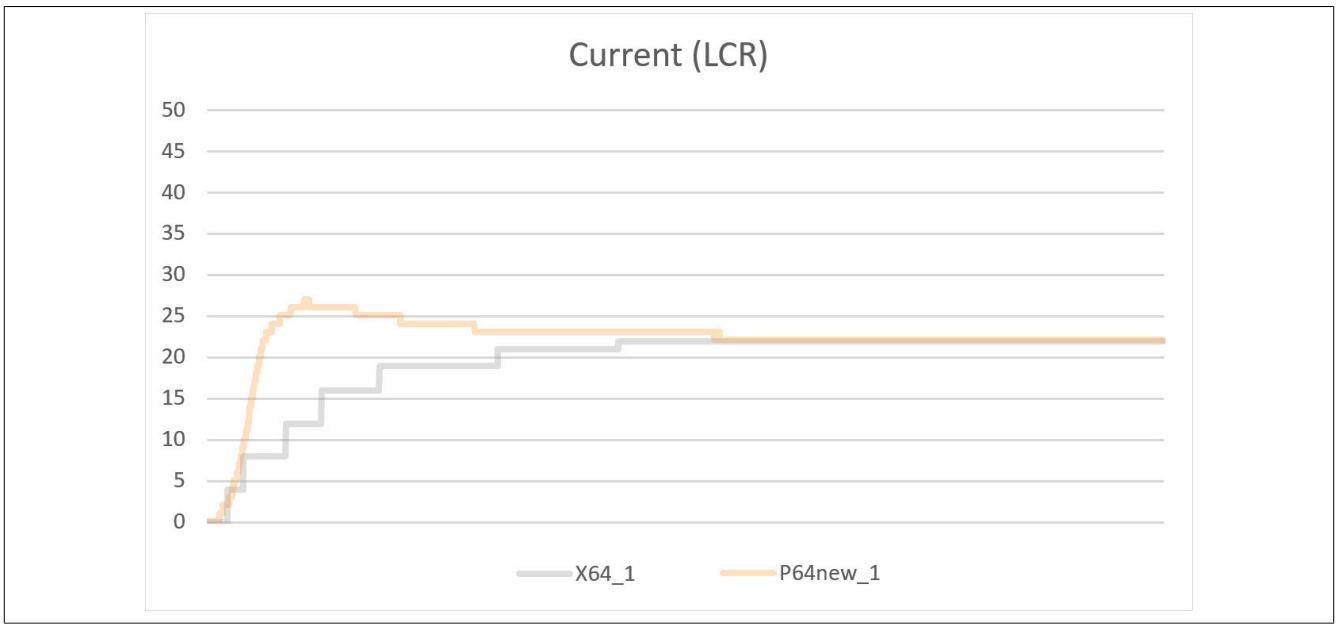
5.3.2 UFT: N

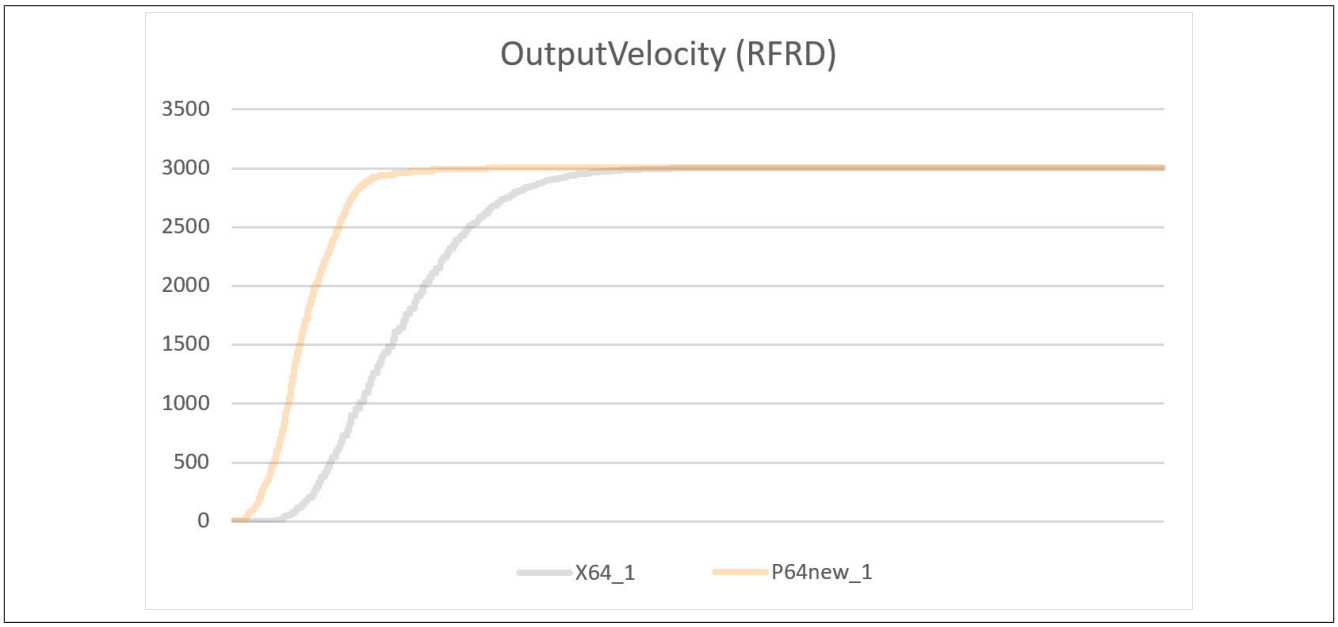
If parameter **[U/F mot 1 selected]** (UFt) is configured to value **[SVC]** (n) in the module configuration (Automation Studio), parameter **[Motor control type]** (Ctt) is set to **[SVC U]** (UUC) on the ACOPOSinverter P64new.

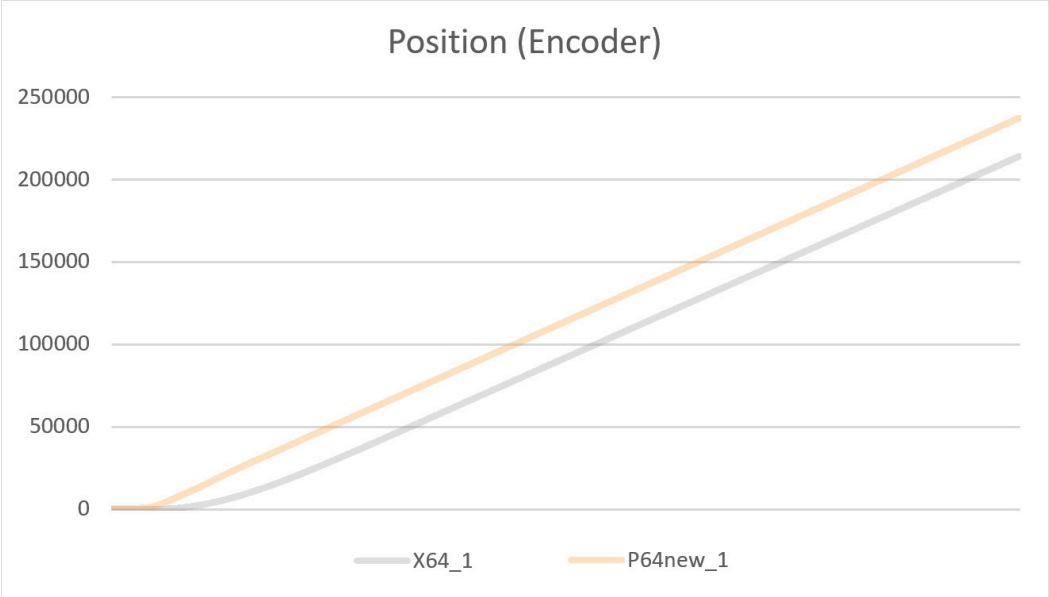
Two series of measurements were carried out and the following step responses recorded.

Measurement series 1

The first diagram shows that the ACOPOSinverter P64new responds in a more agile manner. The increase of the current value is considerably steeper than with the ACOPOSinverter X64. In contrast to the ACOPOSinverter X64, a brief overshoot occurs before the same end value is reached. The second diagram shows that the increased agility has a positive effect on speed control. The requested speed value is reached sooner. However, an overshoot of the speed value does not occur. The third diagram shows that the increased agility also has an effect on the position of the axis. Since the requested speed value was reached faster, the axis of the ACOPOSinverter P64new precedes the axis of the ACOPOSinverter X64.





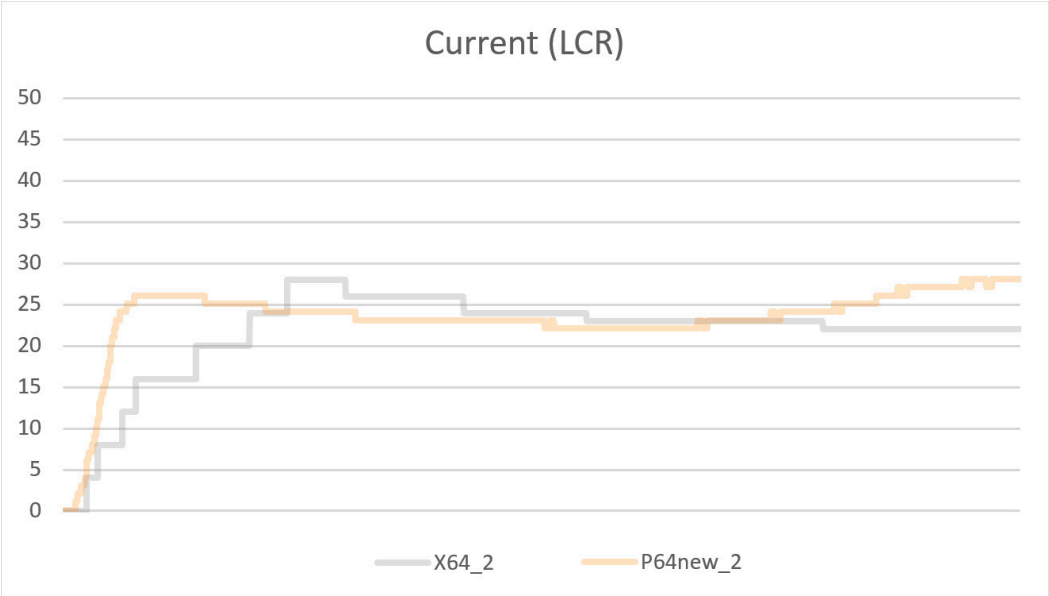


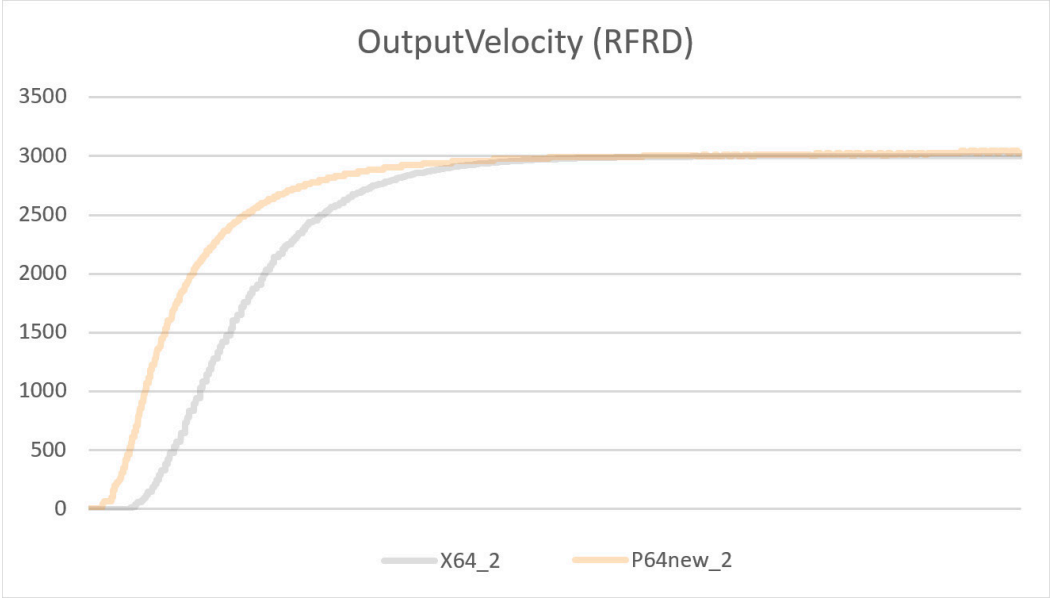
Measurement series 2

An unusual (poorly optimized) configuration was chosen for measurement series two.

Despite the increased deviations in the current measurement, only very small deviations from the other process variables occurred.

The observations from measurement series 1 could be confirmed.




OutputVelocity (RFRD)
3500
3000
2500
2000
1500
1000
500
0
X64_2
P64new_2


Position (Encoder)
250000
200000
150000
100000
50000
0
X64_2
P64new_2

5.3.3 UFT: L

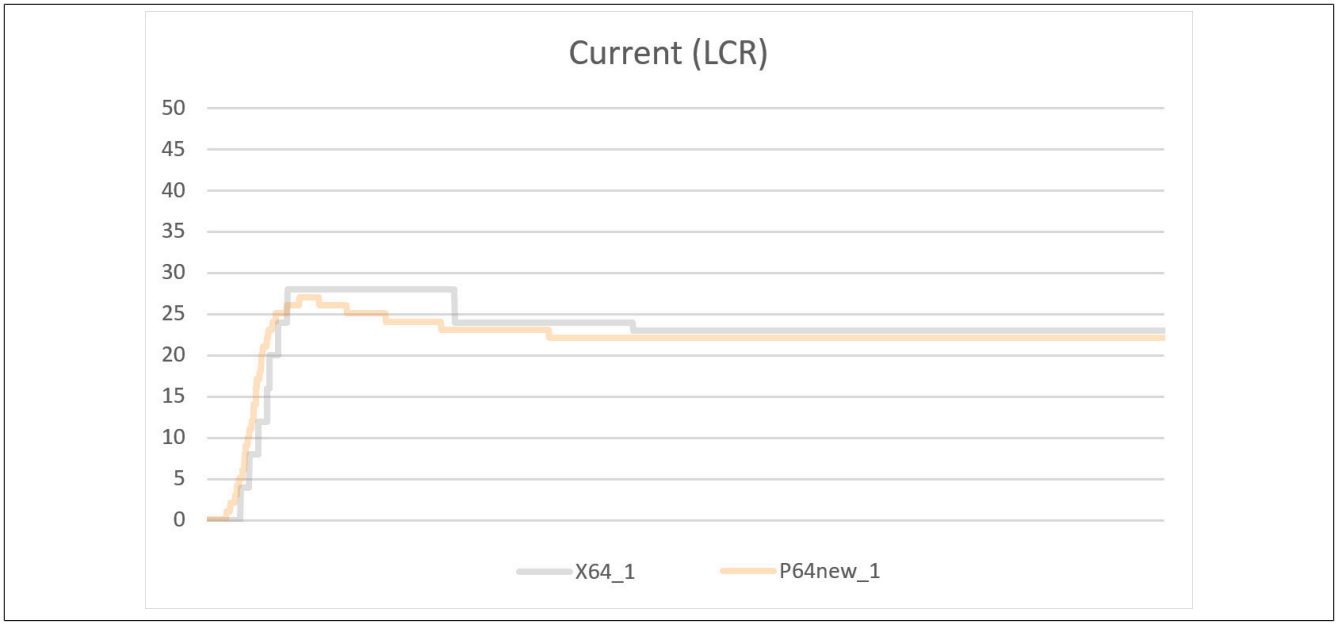
If parameter **[U/F mot 1 selected]** (UFt) is configured to value **[Cst. Torque]** (L) in the module configuration (Automation Studio), parameter **[Motor control type]** (Ctt) is set to **[Standard]** (Std) on the ACOPOSinverter P64new.

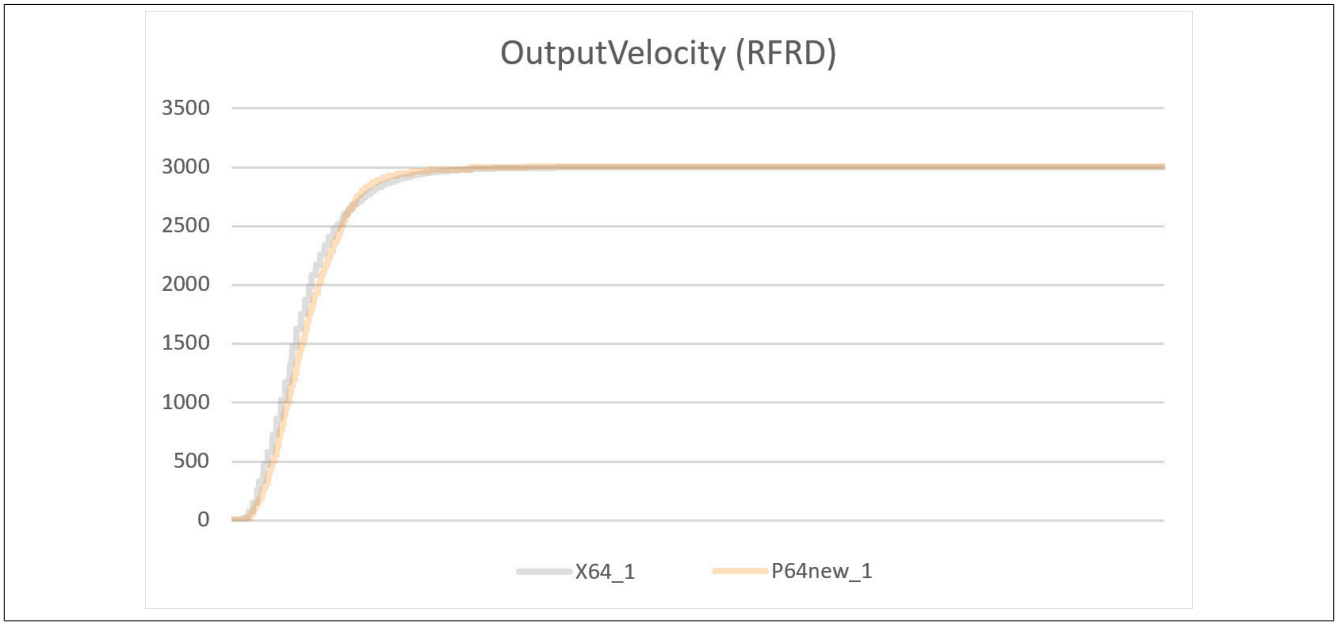
Two series of measurements were carried out and the following step responses recorded.

Measurement series 1

The first diagram shows that the ACOPOSinverter P64new behaves in a similarly agile manner. The increase of the current value is about as steep as with the ACOPOSinverter X64. Just like with the ACOPOSinverter X64, there is a brief overshoot before the approximately same end value is reached. The second diagram shows that speed control is almost running simultaneously. The requested speed value is reached at the same time.

The third diagram shows that the change in position is slightly increased. This deviation can be traced back to component tolerances. Since both cases involve an open control loop in which the steady state is determined on the basis of a calculated value, deviations with regard to the controlled variable can occur.



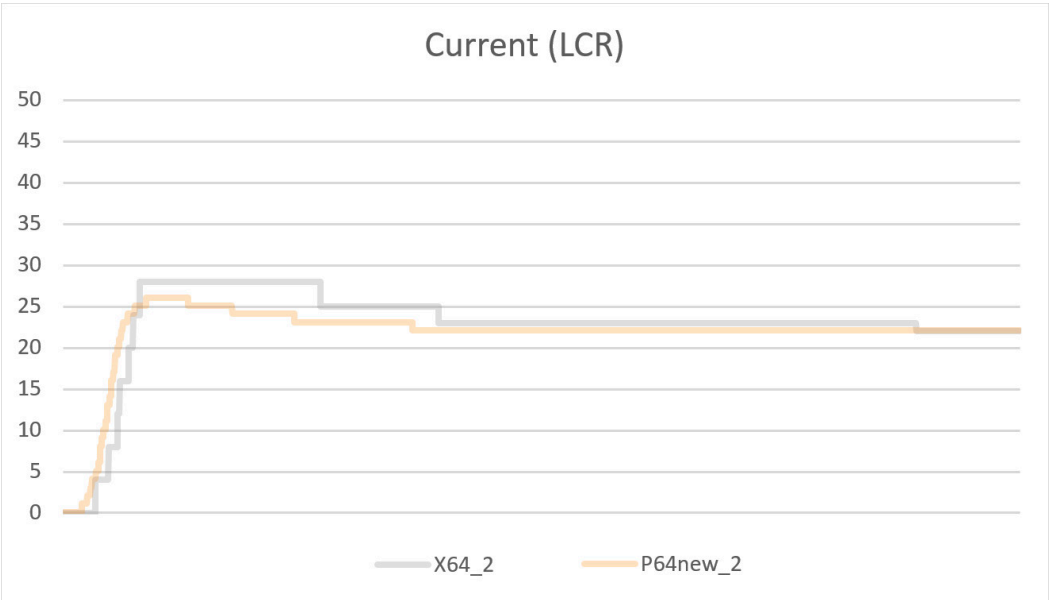


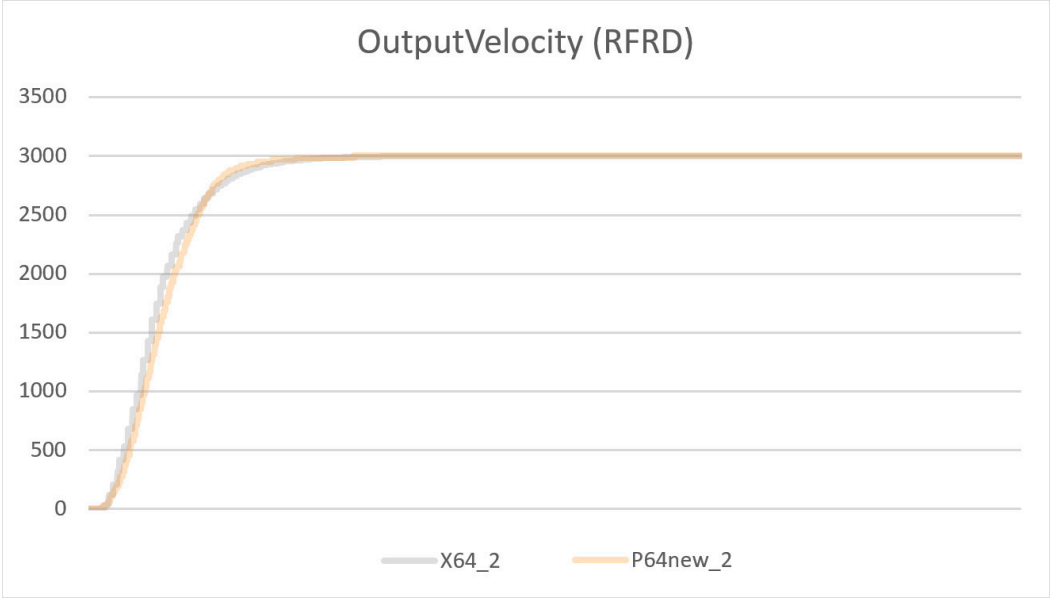
Measurement series 2

An unusual (poorly optimized) configuration was chosen for measurement series two.

Despite the changed configuration, no major deviations could be generated in the current measurement. For this reason, only very small deviations with regard to the other process variables occur.

The observations from measurement series 1 could be confirmed.




OutputVelocity (RFRD)
3500
3000
2500
2000
1500
1000
500
0
X64_2
P64new_2


Position (Encoder)
250000
200000
150000
100000
50000
0
X64_2
P64new_2

5.3.4 UFT: P

If parameter **[U/F mot 1 selected]** (UFt) is configured to value **[Var. Torque]** (P) in the module configuration (Automation Studio), parameter **[Motor control type]** (Ctt) is set to **[V/F Quad.]** (UFq) on the ACOPOSinverter P64new.

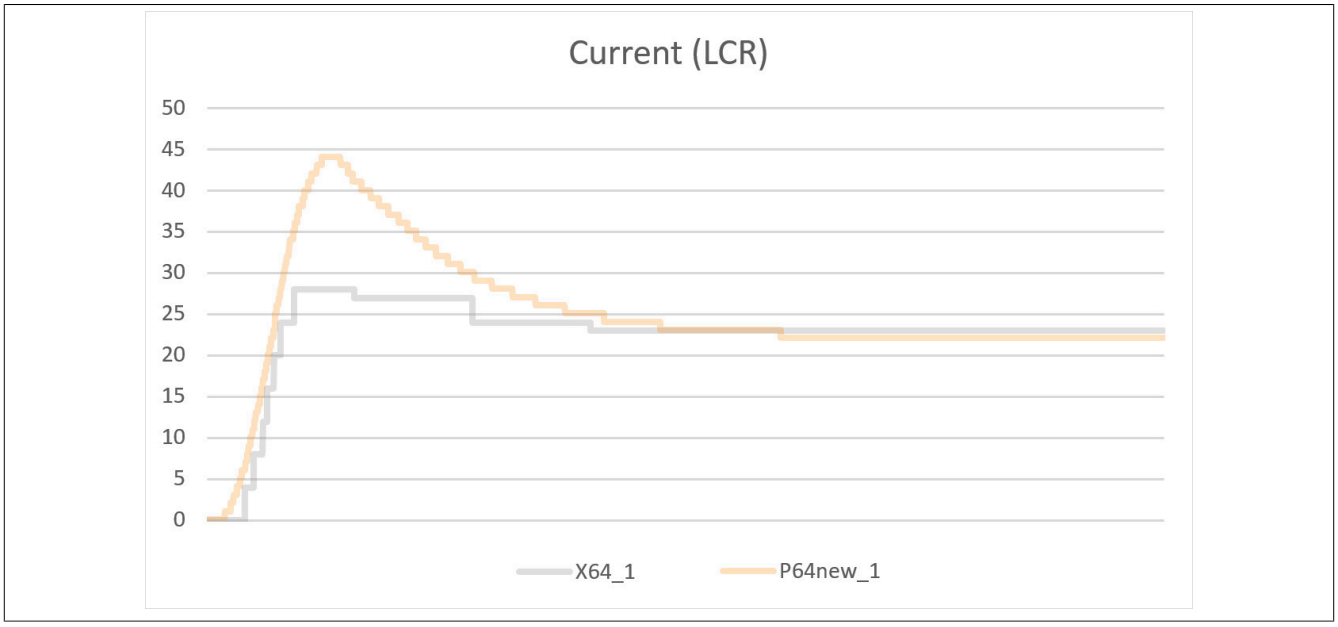
Two series of measurements were carried out and the following step responses recorded.

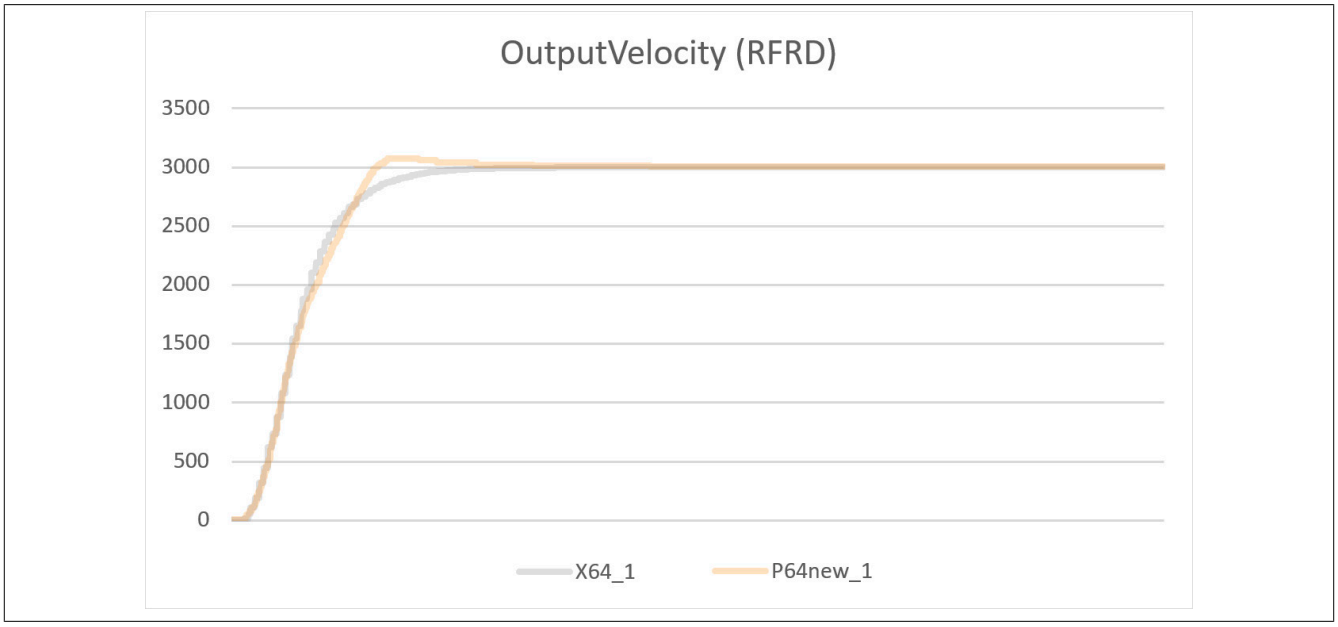
Measurement series 1

The first diagram shows that the ACOPOSinverter P64new replacement product responds in a similarly agile manner. The increase of the current value is almost as steep as with the ACOPOSinverter X64. In contrast to the ACOPOSinverter X64 original product, there is a higher short-term overshoot before the same end value is reached.

The second diagram shows that the higher overshoot of the current also affects speed control. The requested speed value is reached and exceeded faster. The same end value as with the ACOPOSinverter P64new is then set as a result of deceleration.

The third diagram shows that the differences in control behavior only cause very small changes. The position of the axis is almost identical.



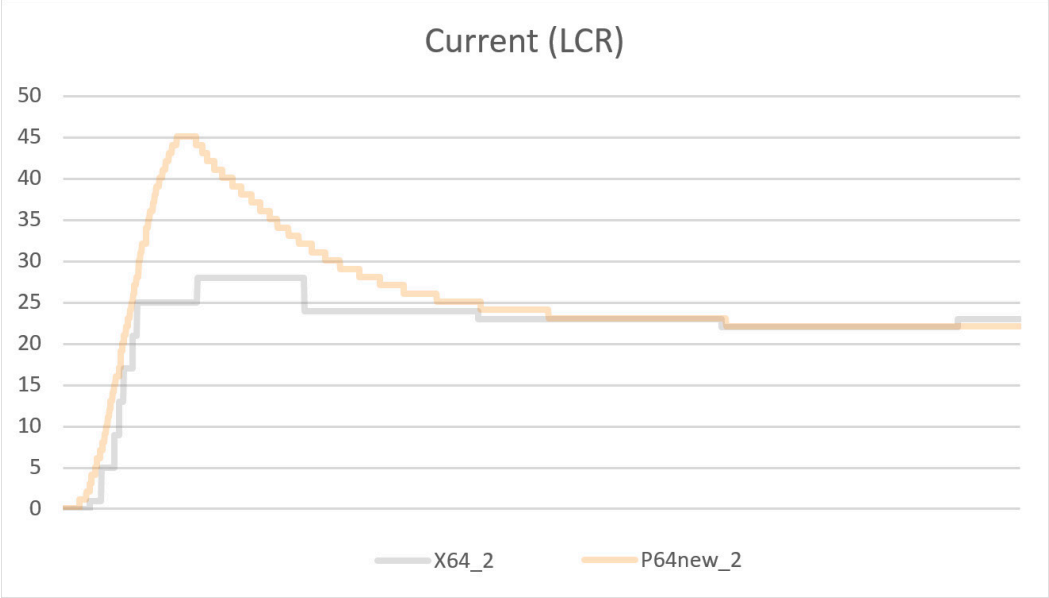


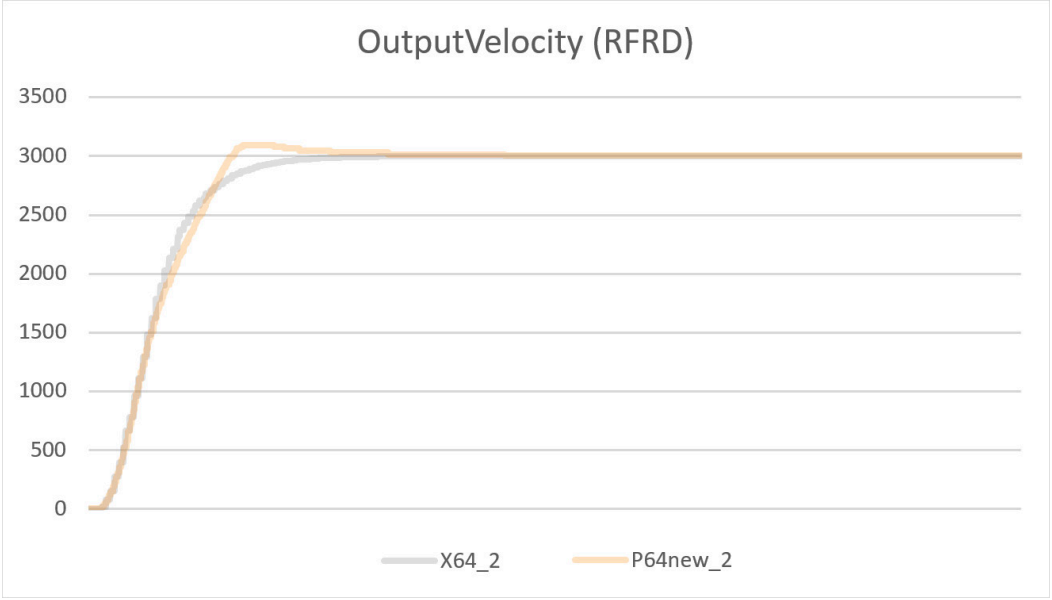
Measurement series 2

An unusual (poorly optimized) configuration was chosen for measurement series two.

By modifying the configuration of the controller, the deviations already mentioned could be increased. However, there is still no noticeable deviation on the axis shown during position detection via the encoder.

The observations from measurement series 1 could be confirmed.




OutputVelocity (RFRD)
3500
3000
2500
2000
1500
1000
500
0
X64_2
P64new_2


Position (Encoder)
250000
200000
150000
100000
50000
0
X64_2
P64new_2

5.3.5 UFT: NLD

If parameter **[Energy Sav.]** (nLd) is configured to value **[Var. Torque]** (P) in the module configuration (Automation Studio), parameter **[Motor control type]** (Ctt) is set to **[Energy Sav.]** (nLd) on the ACOPOSinverter P64new.

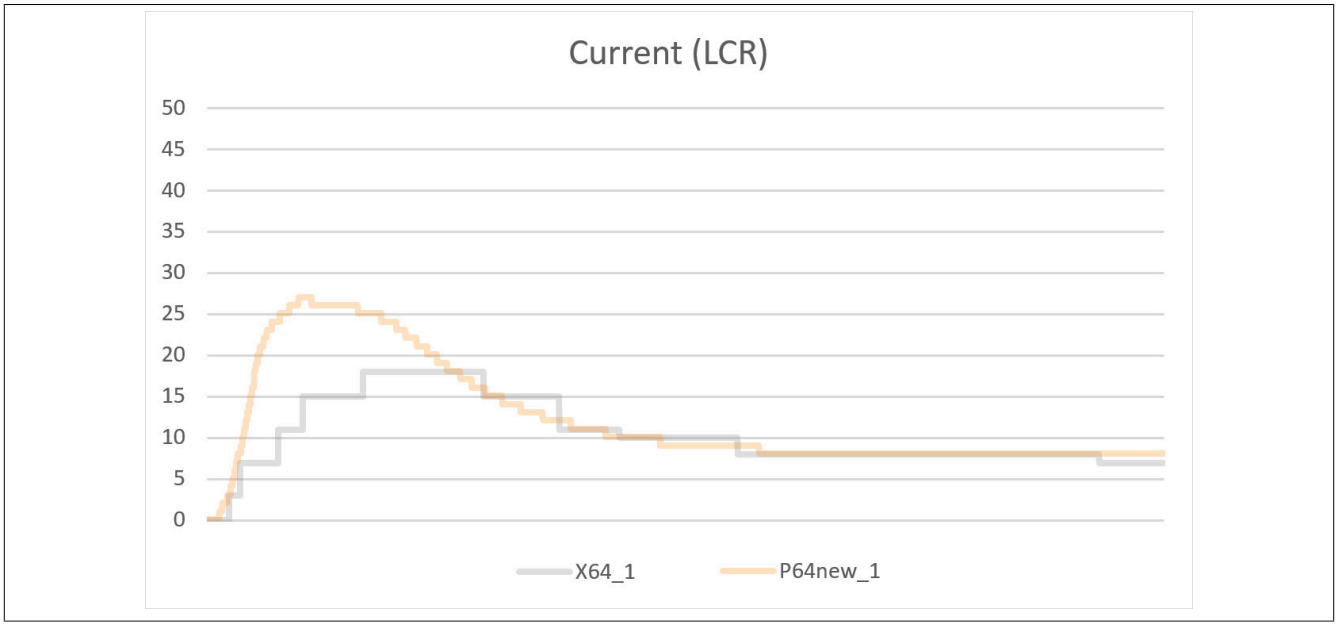
Two series of measurements were carried out and the following step responses recorded.

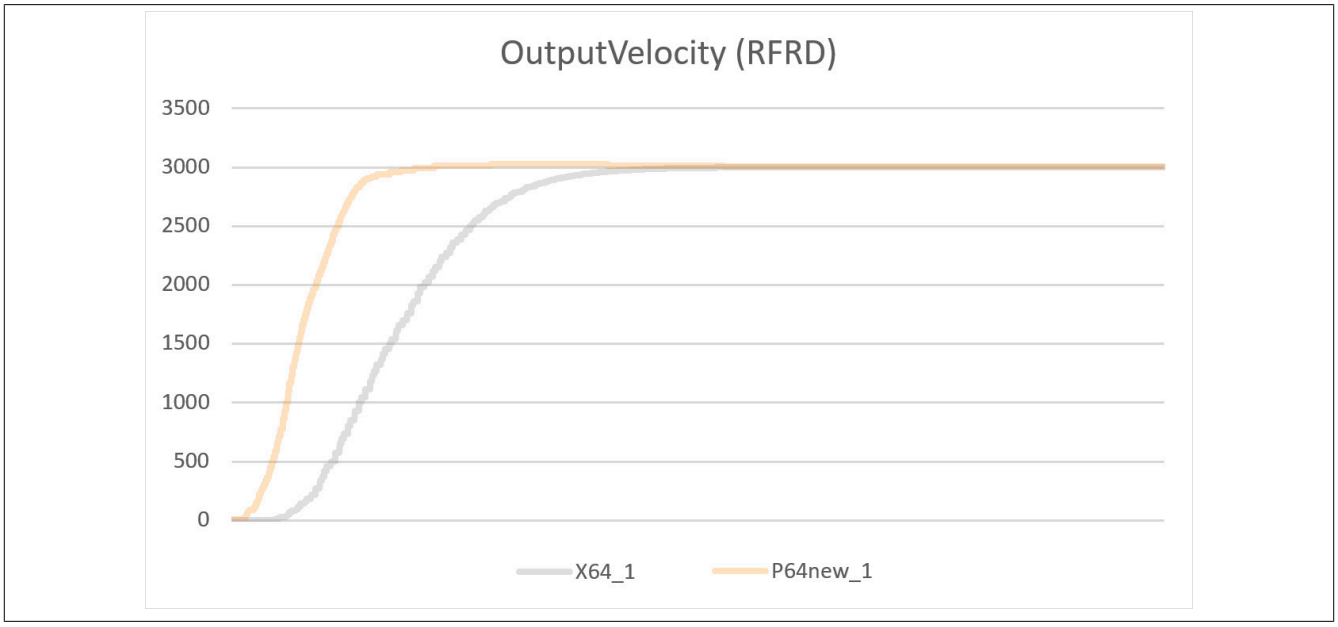
Measurement series 1

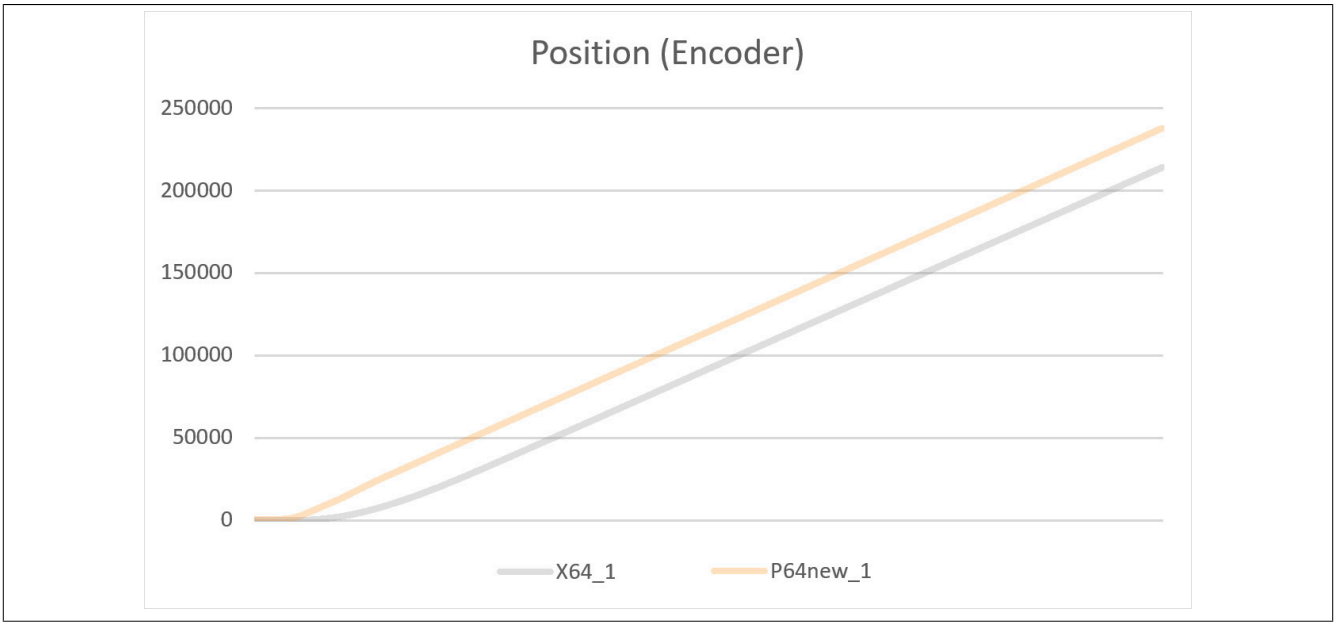
The first diagram shows that the ACOPOSinverter P64new responds in a more agile manner. The increase of the current value is considerably steeper than with the ACOPOSinverter X64. In contrast to the ACOPOSinverter X64, there is a higher short-term overshoot before it reaches approximately the same end value.

The second diagram shows that the higher overshoot of the current also affects speed control. The requested speed value is reached faster and slightly exceeded. The same end value as with the ACOPOSinverter P64new is then set as a result of deceleration.

The third diagram shows that the increased agility also has an effect on the position of the axis. Since the requested speed value was reached faster, the axis of the ACOPOSinverter P64new precedes the axis of the ACOPOSinverter X64.





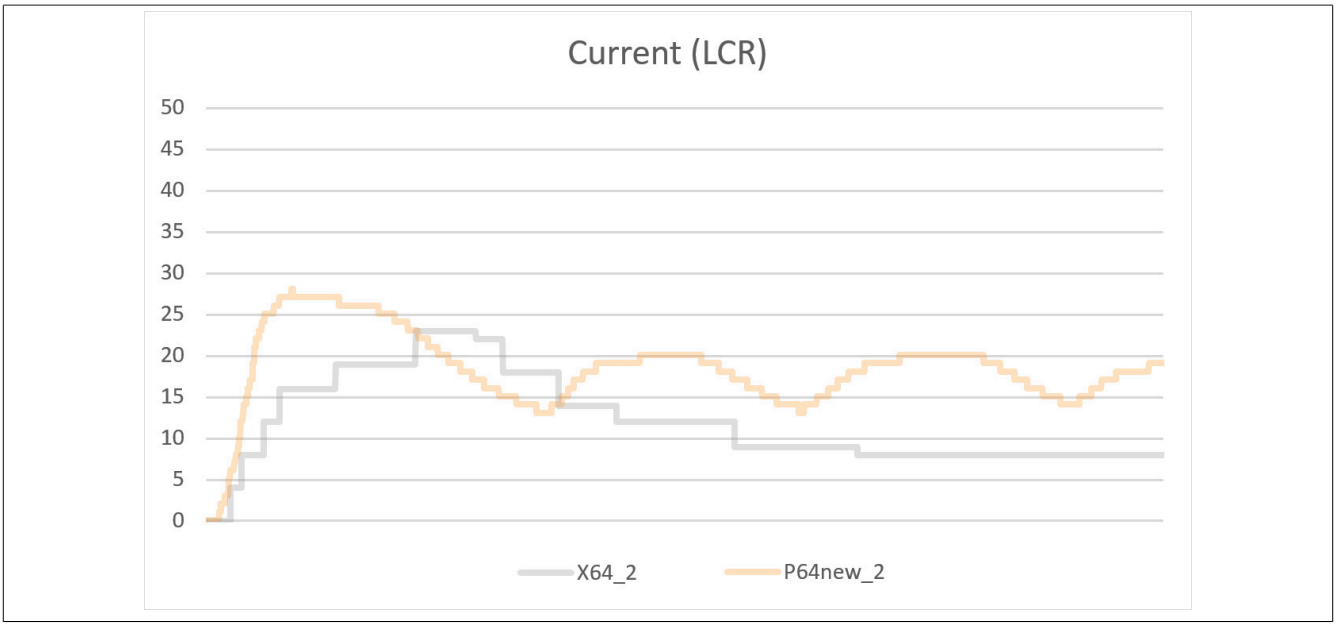


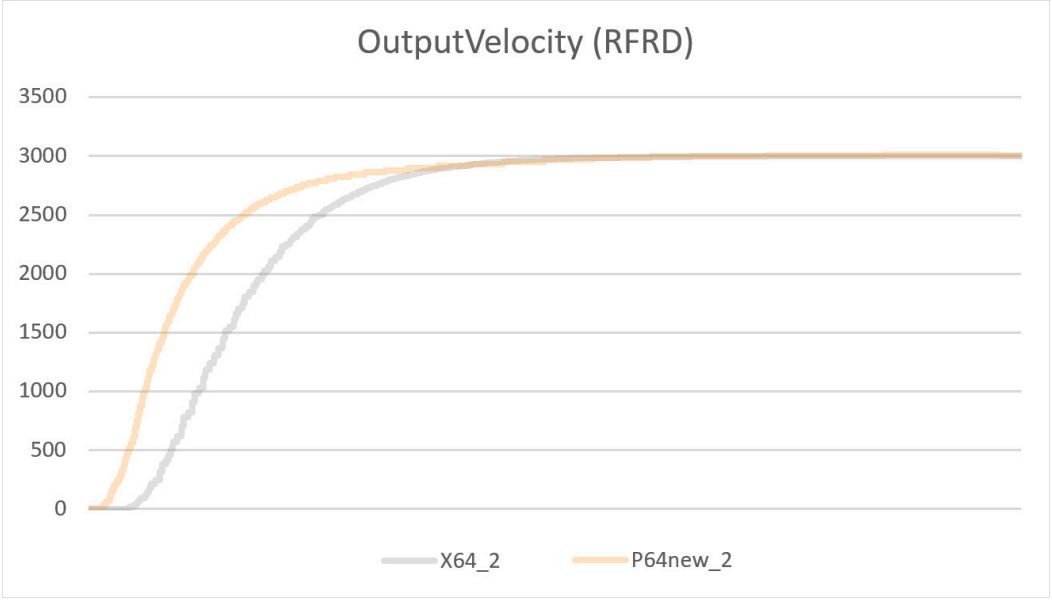
Measurement series 2

An unusual (poorly optimized) configuration was chosen for measurement series two.

By modifying the configuration of the controller, some instability could possibly be generated in the control behavior for the current. Despite this considerable deviation, there was no obvious effect on the stability with regard to the internally calculated value for speed and position monitoring using the encoder.

The observations from measurement series 1 could be confirmed.




OutputVelocity (RFRD)
3500
3000
2500
2000
1500
1000
500
0
X64_2
P64new_2


Position (Encoder)
250000
200000
150000
100000
50000
0
X64_2
P64new_2

6 Application-based differences

This chapter provides information about all known incompatibilities that could affect the project in Automation Studio. It provides information about the required measures for switchover and allows an estimate of the amount of work required.

6.1 Edge counter and AB counter

The counting functions (edge counter and AB counter) are no longer available for the ACOPOSinverter P64new. If these functions are required, a corresponding X20 module (e.g. X20DC1396) must also be implemented.

6.2 High-speed output

With the ACOPOSinverter P64new, the I/Os can no longer be managed directly by the communication card, i.e. the high-speed outputs are no longer available. If this function is required, a corresponding X20 module must also be implemented.

6.3 Controlling the holding brake (function bLC-)

To use function **[BRAKE LOGIC CONTROL]** (bLC-), a digital output of the local I/Os on the drive must be used. Since the timing characteristics of the local I/Os are not guaranteed, migrating this function can only be ensured with limitations.

It is possible to migrate function **[BRAKE LOGIC CONTROL]** (bLC-) with limitations. The configuration of this function is more complex with the ACOPOSinverter P64new. Despite great care, it cannot be guaranteed that all configuration variants of the original product will be accepted. In rare cases, error **[Invalid config.]** (CFI) may occur after replacement.
If a CFI error is displayed after switching to the ACOPOSinverter P64new, adjustments cannot be avoided in the Automation Studio project.

6.4 Defining permissible directions of rotation (parameter ROT)

With the ACOPOSinverter P64new, the permissible direction of rotation (forward/backward) can no longer be limited using parameter **[Rotating direction]**(rOt).

With the ACOPOSinverter X64, parameter **[Rotating direction]**(rOt) can be used to enable a check of the specified speed setpoint. If the incoming reference value contradicts the permissible direction of rotation, the input value is changed to ZERO.

The partial conversion of parameter **[Rotating direction]**(rOt) to parameter **[RV Inhibition]**(rIn) was defined as impermissible. The ACOPOSinverter P64new provides configuration parameter **[RV Inhibition]**(rIn). The effect of this setpoint check differs considerably from that of the ACOPOSinverter X64, however. For this reason, parameter **[RV Inhibition]**(rIn) is not accessible on the ACOPOSinverter P64new.

Warning!

The behavior of the ACOPOSinverter P64new is different with regard to limiting the direction of rotation.

Failure to follow this information can cause damage to the product or accessories.

Possible solution
To generate the behavior of the ACOPOSinverter X64 on the ACOPOSinverter P64new, the reference value must be checked at the output of the reference value source (e.g. checking the sign in the Automation Studio project).

6.5 Auto tuning (Function tUn)

Function "Automatic motor tuning" will still be available for the ACOPOSinverter P64new. Depending on the selected mode, the following should be considered during migration:

- **[Auto tuning]** (tUn) = **[No]** (nO) (default)
  Automatic motor tuning is not enabled. With regard to function "Auto tuning", the Automation Studio project can be migrated without limitations.
- **[Auto tuning]** (tUn) = **[Run]** (rUn)
  Automatic motor tuning is performed for the ACOPOSinverter P64new during the first transition to state "RUN" or "Operation enabled". In contrast to the ACOPOSinverter X64, the measurement is not repeated.
- **[Auto tuning]** (tUn) = **[Power on]** (POn)
  Automatic motor tuning is performed without modifications.
- **[Auto tuning]** (tUn) = **[LI1]** (LI1) to **[LI4]** (LI4)
  Automatic motor tuning is performed for the ACOPOSinverter P64new if the configured trigger is actuated. In contrast to the ACOPOSinverter X64, the drive must be in state "RUN" or "Operation enabled" at the time of the measurement and the bit of command STOP must be set.

6.6 Bit 11 of control word "CMDD" (direction reversal)

With the ACOPOSinverter P64new, bit 11 of control word "CMDD" can still be used for the direction reversal function of the motor.

Notice!

In contrast to the ACOPOSinverter X64, bit 11 of control word "CMDD" can only be used for the direction reversal function to change the direction of rotation of the connected motor if configuration parameter [Rotating direction](rOt) = [Both] (bOt) has been configured.

Possible solution

The command to reverse the direction of the motor can only be executed via bit 11 of control word "CMDD" if the bit was previously assigned a different function.
This behavior corresponds to the original product.

6.7 Bit 12 of command word "CMDD" (command STOP)

With the ACOPOSinverter P64new, bit 12 of command word "CMDD" can still be used to stop the motor.

Notice!

Specification DS 402 requires that bit 8 of the command word initiates command STOP. The deviating behavior of the original product was applied to the replacement product.

This behavior corresponds to the original product.

6.8 Resetting the parameter set (control word "CMI")

With the ACOPOSinverter P64new, the command for resetting the parameter set can still be used via bit 0 of control word "CMI". The command must be extended, however.

The ACOPOSinverter P64new is based on a different drive variant. Some values of the default parameter set differ from the ACOPOSinverter X64. To reproduce the original default parameter set, command "Reset to default" must be added.

A special firmware has been developed for the communication card of the ACOPOSinverter P64new that carries out all known adjustments after resetting the parameter set when the drive is started. To trigger a restart with the ACOPOSinverter P64new, register "RP" can be used.

Previous command:

Order	Command	
1	Write "Reset to default"	Write "TRUE" to bit 0 of CMI_Output

Extension of the reset procedure:

Order	Command	
1	Write "Reset to default"	Write "TRUE" to bit 0 of CMI_Output
2	Enable reference change	Write "TRUE" to bit 15 of CMI_Output
3	Set PLC as command reference	Write 167 to FR1_Output
4	Write "Restart device"	Write "TRUE" to bit 0 of RP_Output
5	Wait for "ModuleOk"	Read ModuleOk until "TRUE"

6.9 Ramp switchover (control word "CMI")

With the ACOPOSinverter P64new, the command for switching the acceleration/deceleration ramp can no longer be executed using bit 4 of control word "CMI". If the ramp switchover is implemented using bit 4 of control word "CMI", the application cannot be migrated.

Danger!

UNEXPECTED OPERATION OF THE EQUIPMENT

Make sure that enabling this function does not result in unsafe states.

Failure to follow these instructions can result in death or serious injury.

Possible solution

With the ACOPOSinverter P64new, the RPS event can be used to trigger the ramp switchover. Parameter **[Ramp switch ass.]** (rPS) can be set in the module configuration in Automation Studio.

6.10 Operator change (control word "CMI")

With the ACOPOSinverter P64new, the command for switching the setpoint and command source can no longer be implemented. If the operator change is implemented using bit 14 of control word "CMI", the application cannot be migrated completely.

Danger!

UNEXPECTED OPERATION OF THE EQUIPMENT

The operator change using bit 14 of control word "CMI" made it possible to switch the setpoint and command source (X2X, terminal block, HMI). The command of the drive was transferred away from the controller to the respective configured information source. The default values of the controller were ignored during this.

Switching the setpoint and command source is not supported on the ACOPOSinverter P64new. Setpoints and commands can only be entered from the controller.

Make sure that enabling this function does not result in unsafe states.

Failure to follow these instructions can result in death or serious injury.

6.11 Operator change (function FLOC)

Function "forced local" (FLOC) is no longer available for the ACOPOSinverter P64new. If this type of operator change is implemented, the application cannot be completely migrated.

Danger!

RISK OF ELECTRIC SHOCK, ARC FLASH OR EXPLOSION

Function FLOC makes it possible to overwrite the setpoint and command sources. The command of the drive was transferred from the controller to the HMI application as the source of information. The default values of the controller were ignored during this.

Switching the setpoint and command source is not supported on the ACOPOSinverter P64new. Setpoints and commands can only be entered from the controller.

Failure to follow these instructions can result in death or injury.

6.12 Switching the "motor nameplate" (Function CHP-)

With the ACOPOSinverter P64new, function "Switching the motor parameters" is no longer available. If several motors with different nameplates are stored in the application, the application cannot be migrated completely.

Warning!

The behavior of the ACOPOSinverter P64new differs with regard to switching the motor nameplate.

Failure to follow this information can cause damage to the product or accessories.

Possible solution
This use case is rare since the effort for programming and wiring is relatively high. Certain requirements (e.g. correct switchover via motor protecting switch) must be met in order to switch over the motor with parameter **[SWITCHING MOTOR]**(CHP-).
Instead of function "second motor", separate configurations can be created in Automation Studio that can be switched at runtime using Automation Studio library "AsIoMMan".

6.13 Access restrictions (parameters COD, LAC)

For the ACOPOSinverter P64new, it was decided not to use an access code (parameter **[PASSWORD]**(COd)) to protect the current parameter set. In addition, it was decided not to define multiple different access levels (parameter **[ACCESS LEVEL]**(LAC)).

Possible solution
Function **[PASSWORD]**(COd) is not implemented on the ACOPOSinverter P64new. The analysis of the original product shows that the set values from the module configuration (Automation Studio) were not transferred correctly to the original product.
It was decided not to change the default settings of the replacement product, i.e. the drive's configuration parameters can be accessed via the HMI application without having to enter a password.
With the ACOPOSinverter P64new, parameter **[ACCESS LEVEL]**(LAC) is preset so that the user has full access ("expert mode"). This behavior corresponds to the original product and can be adjusted using Automation Studio library "AsIoAcc".

6.14 Fallback speed (parameter LFF)

Function "Fallback speed" is no longer offered for the ACOPOSinverter P64new. If parameter **[Fallback speed]**(LFF) is used to define a speed not equal to "0", the application cannot be migrated completely.

Danger!

UNEXPECTED OPERATION OF THE EQUIPMENT

For safety reasons, it is recommended to not use this function at all. When using the drive via a controller, using a function like this is unusual and can result in unexpected behavior of the entire system.

Failure to follow these instructions can result in death or injury.

6.15 Safety functions

No safety functions are enabled for the ACOPOSinverter P64new.

Possible solution
The ACOPOSinverter X64 does not provide comparable functions. Since the ACOPOSinverter P64new is a pure replacement product, no new functions are offered.

6.16 PI(D) control

Function "PI(D) control" is not enabled for the ACOPOSinverter P64new.

Possible solution
The manual of the original product contains information about this function. Since this function is not integrated in the user interface of the ACOPOSinverter X64, however, it is not offered for the replacement product.

6.17 Extended control word "CMI

The extended control word "CMI" is device-specific. For this reason, an exact match cannot be guaranteed for the ACOPOSinverter P64new.

The following deviations are known:

-
- Bit 00: Command see ""Reset to default"" on page 32 requires an additional restart.
- Bit 04: Function see ""Ramp switching"" on page 33 can no longer be requested.
- Bit 13: Function see ""Forced local"" on page 33 can no longer be requested.

Possible solution
Control word "CMI" is a device-specific extension that is not required in communication profile DS402. In principle, the device can be used without any limitations even without this additional command word.

6.18 Extended status word "ETI"

Extended status word "ETI" is device-specific. For this reason, an exact match cannot be guaranteed for the ACOPOSinverter P64new.

The following deviations are known:

- Bit 06: For the ACOPOSinverter P64new, "Steady state" is no longer reported outside DS402 status 5 "Operation enabled" or "RUN".

Possible solution
Status word "ETI" is an extension that is not required in communication profile DS402. In principle, the device can be used without limitations even without this additional status word.

7 Problems and solutions

7.1 Boot loop

If the ACOPOSinverter P64new gets stuck in the boot loop after replacement, a 1-to-1 replacement is unfortunately not possible. To continue using the existing Automation Studio project, an updated version of hardware upgrade "8I64xxxxxxx.00X -1" must be installed.

In the updated upgrades (version 1.4.1.0 or later), extensions have been implemented in the hardware file to optimize the cyclic data on the X2X bus for the ACOPOSinverter P64new. Depending on the module configuration, these optimizations may be necessary.

Recommended procedure

1) Create a backup of your Automation Studio project.
2) Import the updated upgrade into your project.
3) Load the Automation Studio project onto the controller again.
4) If the drive leaves the boot loop, no further adjustments are necessary.
   If the drive is still stuck in the boot loop, follow the steps below.
5) Check whether data point "ACPi_ModuleID" is linked to a variable in the project.
6) Switch "Inverter information" from "I/O mapping (max. traffic)" to "I/O mapping (more traffic)". After saving, data point "ACPi_ModuleID" is no longer registered as UDINT but as UINT on the X2X bus. No information is lost during the switchover since all valid module IDs are less than 65535.
7) Adjust the data type of the linked project variable and establish a link to the adjusted data point in IO mapping.