1.4 ”SIMODRIVE 611 universal E” control board

Description

The ”SIMODRIVE 611 universal E” control board is used with SINUMERIK 802D with the ”motion control with PROFIBUS-DP” function.
Using this function, it is possible to implement a clock-synchronous drive coupling between a DP master (e.g. SINUMERIK 802D) and the DP slave ”SIMODRIVE 611 universal E”.

Features

The control board has the following features:

- Control board (refer to Chapter 1.4.1)
  - Order No. (MLFB):
    before SW 5.1: 6SN1118-0NH10-0AA□
    (”SIMODRIVE 611 universal E” control board)
    □: Space retainer for hardware function
    from SW 5.1: 6SN1118-0NH11-0AA0
    (”SIMODRIVE 611 universal E HR” control board)
    from SW 9.1: 6SN1118-0NH11-0AA1
    (”SIMODRIVE 611 universal E HRS” control board)
  - 2-axis for encoders with sin/cos 1Vpp
  - with memory module for n-set
- Optional PROFIBUS-DP3 module (refer to Chapters 1.3.3 and 1.4.1)
  - Order No. (MLFB): 6SN1114-0NB01-0AA0
- The parameters can be set as follows:
  - using the ”SimoCom U” parameterizing and start-up tool on an external PG/PC (refer to Chapter 3.3)
  - using the display and operator unit on the front panel (refer to Chapter 3.2)
  - using PROFIBUS-DP (parameter area, PKW area, refer to Chapter 5.6.7)
- Software and data

  The software and the user data are saved on an interchangeable memory module.
- Terminals and operator control elements
  - 2 analog inputs and 2 analog outputs per drive
  - 2 digital inputs and 2 digital outputs per drive
  - 2 test sockets
  - POWER-ON RESET button with integrated LED
  - Display and operator unit
- Safe start inhibit

  Detailed information about this function is provided in

  Reference: /PJU/, SIMODRIVE 611, Configuration Manual, Drive Converters
- Serial interface (RS232, refer to Chapter 3.3.3)

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1.4.1 Diagram of the board and optional module

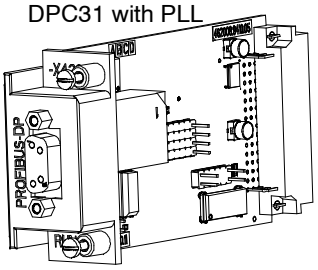
Control board with optional PROFIBUS-DP module

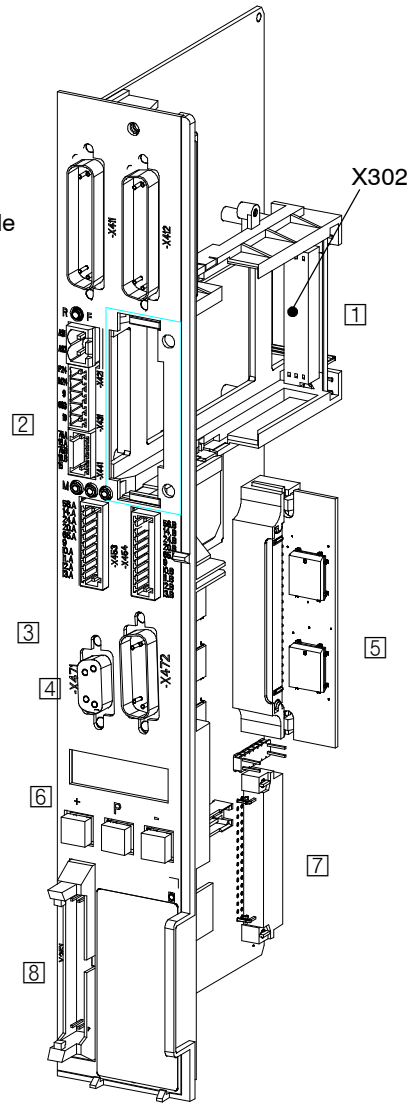
”SIMODRIVE 611 universal E” control board

2 axis for encoders with sin/cos 1Vpp

Optional PROFIBUS-DP3 module

with PROFIBUS-ASIC DPC31 with PLL





1
Mounting slot for the optional PROFIBUS-DP3 module

2
- Interfaces
- Terminals
- Test sockets

3
Serial interface (RS232)

4
Encoder interface for TTL encoders

5
Memory module
- Firmware
- User data

6
Display and operator unit

7
Pulse interface

8
Equipment bus

The following applies to retaining screws:

Tighten (due to the shield contact)

Max. torque = 0.8 Nm

For plug connections:

Plug connectors with the same number of pins must be appropriately coded so that they cannot be interchanged (refer under the index entry ”Coding the mini connectors”).

Fig. 1-9 ”SIMODRIVE 611 universal E” control board with optional PROFIBUS-DP3 module

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1.4.2 Elements on the control board front panel

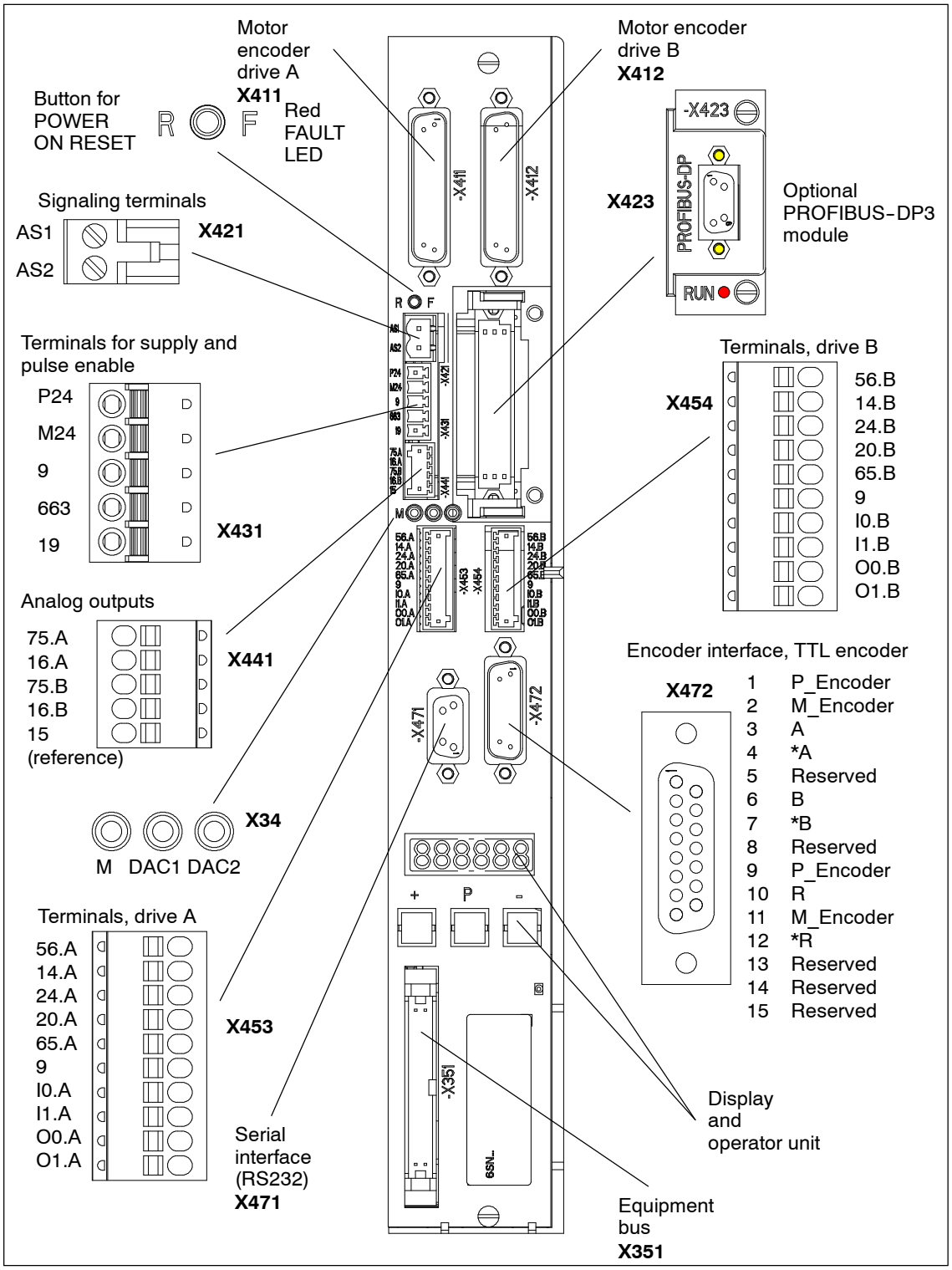


Fig. 1-10 Elements on the front panel of ”SIMODRIVE 611 universal E”

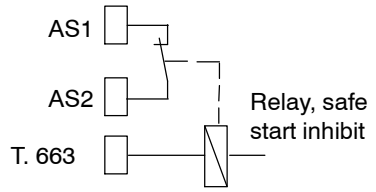
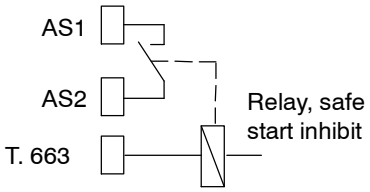
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1.4.3 Description of the terminals, interfaces and operator control elements

Board-specific terminals and interfaces

The board-specific terminals and interfaces are available, common for both drive A and B.

Table 1-5 Overview of the board-specific terminals and interfaces

Terminal No.	Terminal Designation	Function	Type 1)	Technical specifications
Signaling terminal, start inhibit (X421)				
AS1 AS2	**X421**	Signaling contact Start inhibit Feedback signal from terminal 663	NC	Connector type: 2-pin conn. strip Max. cond. cross-sect.: 2.5 mm^2 Contact: Floating NC contact Contact load capability: at 250 $_{VAC}$ max. 1 A 2) at 30 $_{VDC}$ max. 2 A
	 Pulses not enabled (T. 663) The gating pulses of the power transistors are inhibited.			 Pulses enabled (T. 663) The gating pulses of the power transistors are enabled.
Terminals for supply and pulse enable (X431)				
	X431			Connector type: 5-pin conn. strip Max. cond. cross-sect.: 1.5 mm^2
P24	X431.1	External power supply for digital outputs (+24 V)	S	Voltage tolerance (including ripple): 10 V to 30 V Max. aggregate current: 2.4 A **Note:** • The external supply is required for the 4 digital outputs (O0.A, O1.A and O0.B, O1.B). • When dimensioning the external power supply, the total current of all of the digital outputs must be taken into account.
M24	X431.2	Reference for the external supply	S	
9	X431.3	Enable voltage (+24 V)	S	Reference: Terminal 19 Maximum current(for the total group): 500 mA **Note:** The enable voltage (terminal 9) can be used to supply the enable signals (e.g. pulse enable) as 24 V auxiliary voltage.

1) NC: NC contact; S: Supply
2) Corresponding to EN 60204-1 (Safety of Machinery), control transformers should be used when using AC control voltages.

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Table 1-5 Overview of the board-specific terminals and interfaces, continued

Terminal No.	Terminal Designation	Function	Type [1]	Technical specifications
Terminals for supply and pulse enable (X431), continued				
663	X431.4	Pulse enable (+24 V)	I	Voltage tolerance (including ripple): 21 V to 30 V Typ. current consumption: 25 mA at 24 V **Note:** The pulse enable acts simultaneously on drive A and drive B. When this pulse enable is withdrawn, the drives "coast down" unbraked.
19	X431.5	Reference (Reference for all digital inputs)	S	**Note:** If the enable signals are to be controlled from an external voltage and not from terminal 9, then the reference potential (ground) of the external source must be connected to this terminal.
Serial interface (X471)				
-	**X471**	Serial interface for "SimoCom U"	IO	Connector type: 9-pin D-sub socket connector **Note:** • The interface can only be used as RS232 interface --> refer to Chapter 3.3.3 • Pin assignment of the interface --> refer to Chapter 2.4 • Cable diagram for RS232 --> refer to Chapter 2.5
PROFIBUS-DP interface (X423) for the optional PROFIBUS-DP3 module				
-	**X423**	Communications interface for PROFIBUS	IO	Connector type: 9-pin D-sub socket connector **Note:** • Pin assignment of the interface --> refer to Chapter 2.4 • Connecting diagram and connecting-up the optional PROFIBUS-DP module --> refer to Chapter 2.3.4 • Communications via PROFIBUS-DP --> refer to Chapter 5
Equipment bus (X351)				
-	**X351**	Equipment bus	IO	Ribbon cable: 34-pole Voltages: various Signals: various
Test sockets (X34)				
DAC1	**X34**	Test socket 1 [2]	MA	Test socket: ∅ 2 mm Resolution: 8 bits Rated operating voltage: 0 V to 5 V Maximum current: 3 mA
DAC2		Test socket 2 [2]	MA	
T		Reference	MA	

1) I: Input; S: Supply; IO: Input/output; MA: Measuring signal, analog
2) Can be freely parameterized

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2.1.5 Replacing a defective HRS control board by a new one

General

From 10.2005 onwards, there will be a new ”SIMODRIVE 611 universal HRS” or ”SIMODRIVE 611 universal E HRS” control board with a higher computational performance (refer to Chapter 1.3 or 1.4). This new hardware simultaneously replaces the previous types and is coupled to the new software ⩾SW 8.3.

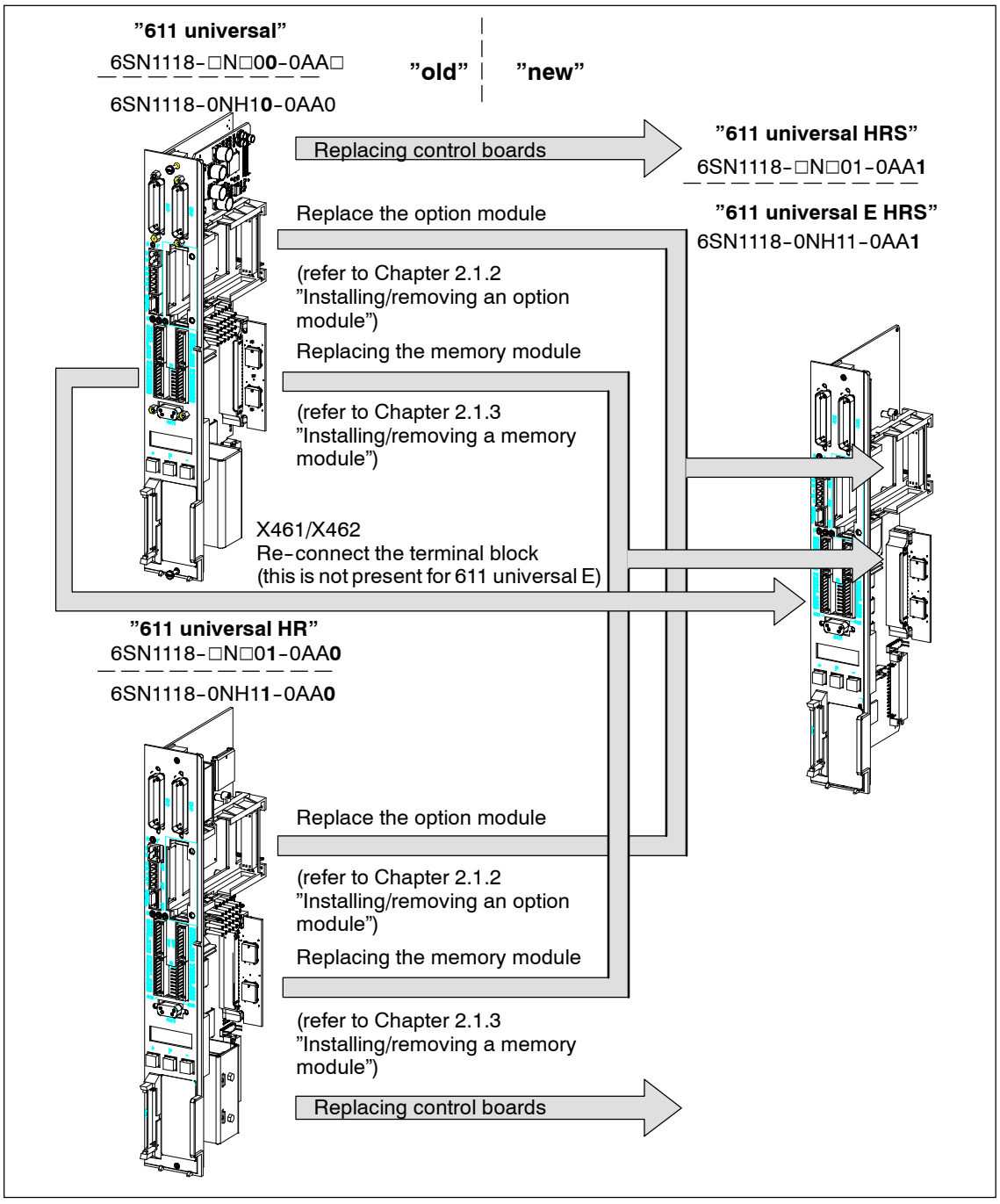


Fig. 2-4 Replacing a defective HRS control board by a new one

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How is a control board replaced?

A control board is installed/removed as follows:

1. The user data should be in a file that has been backed-up. This is because the ”old” memory module does not always run in the new control board.
2. Ensure that the power module is in a no-voltage condition.
3. Release the screw connection and withdraw the ”old” control board from the power module.
4. Remove the memory module from the defective (”old”) and insert this into the ”new” control board, refer to Chapter 2.1.3 ”Installing/removing a memory module”.
5. Insert the ”new” control board, tighten the retaining screws (2 screws at the front panel, max. torque = 0.8 Nm) and connect the equipment bus.
6. Switch on the drive. If the drive system successfully boots, then the operation to replace the board has been completed and you can continue with Point 11.. Otherwise, carry-out the following steps 7. to 10..
7. Install the ”SimoCom U” start-up tool, **Version 8.3 (or higher)**.
8. Power-down/power-up the drive again and start the ”SimoCom U” commissioning tool.
9. Comply with the request in ”SimoCom U” ”necessary to upgrade the firmware” by installing firmware version 8.3 (or higher).
10. If communications are not established or the system does not boot after it has been upgraded, then the old memory module is either defective, and cannot be used and must be replaced by the memory module of the new control board. The appropriate user data should be downloaded from the archived file.

    For a control board with motors with absolute value encoders and a firmware release <9.1, the axes must be re-referenced, even if they already appear to have been referenced. If referencing the axis is complicated and time consuming, then there is a possibility of saving the reference points. A description on this is provided in Product Support in the Internet under FAQs ID21821692.
11. Re-connect the front panel of the module corresponding to the connection diagram. Insert the mating connector at the appropriate interface.

Notice

Plug connectors X461 and X462 have been extended , for ”HR and ”HRS”, to an 11-pin version. This means that the assigned signal conductors of the (10-pin) terminal block of the SIMODRIVE 611 universal must be re-connected to the new (11-pin) terminal block. (terminal block assignment, refer to Fig. 1-5).

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