rho 3

Signal description and Error messages

Version 103

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rho 3

Signal description and Error messages

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1 r h o 3 Interface Signals

1.1 General

The integrated PLC PIC250, standard in the rho 3, allows the user to flexibly configure machine interfaces by assigning terminals on the respective I/O cards as the situation requires. The same applies if bit coupling is carried out to a CL300/PC600 instead of an I/O card with PIC250 (installation of the bit coupler instead of the I/O card).

This RC-internal interface is common to all variants. It is the basis for correct execution of the robot control programs.

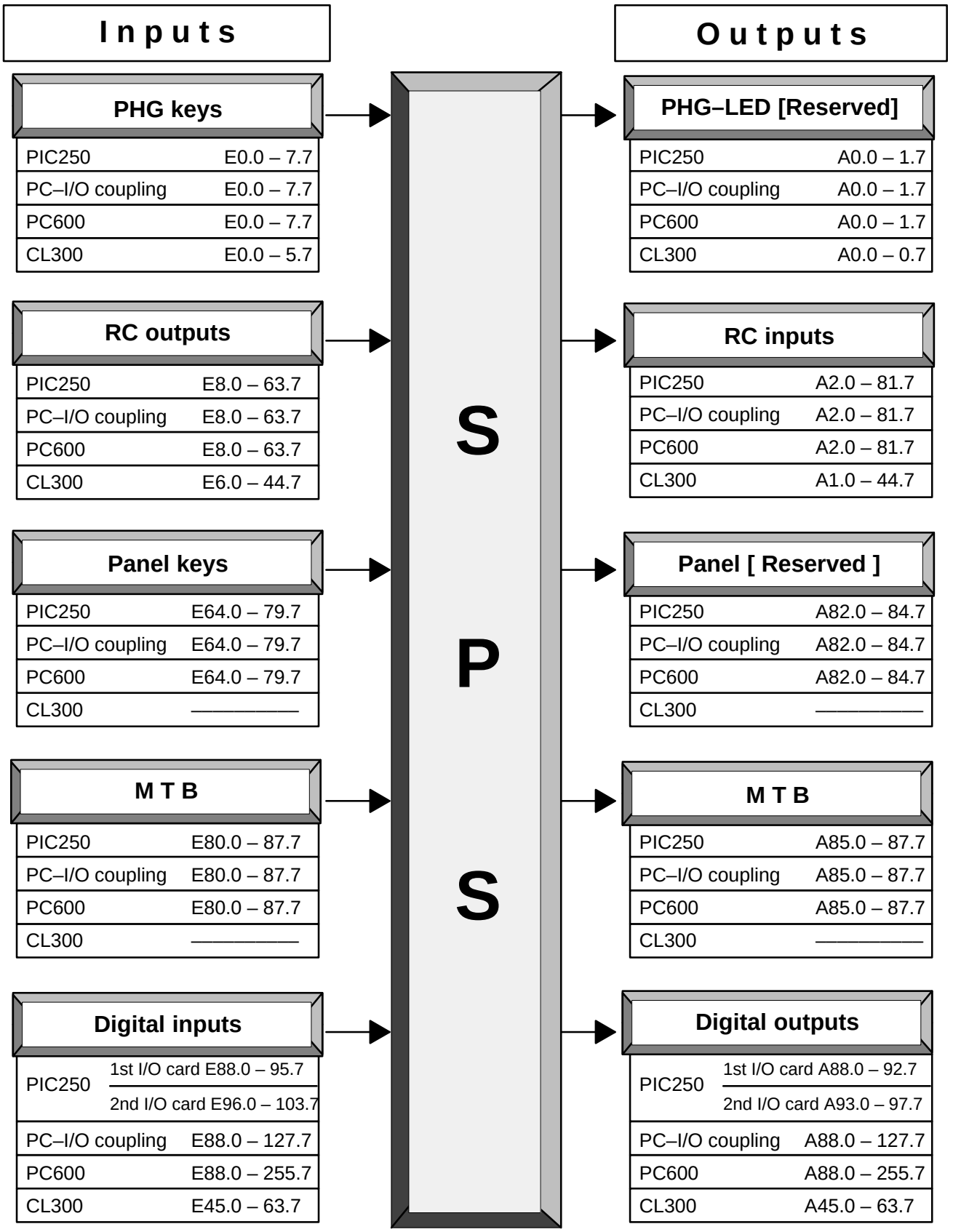
In order to avoid incorrect operations as much as possible, all signals included in the RC-internal interface are described in the following. These signals are explained in the order of their position in the interface, and not on the basis of function groups. Where necessary, signal dependencies are also described. The functional or temporal dependencies are shown in the context of the current signal.

1.1.1 Programming the integrated PLC

a) with ROPS3 – ON/OFFLINE programming software
   by means of BAPS – QLS – P2O, P2X

b) using BOSCH PLC Profi software in the IL
   Instruction List

1.1.2 PIC / PC600/CL300 address ranges



2 Temporal Sequence of Signal Exchange

2.1 With PIC250 (also applies to PC–I/O coupling)

On the rho3.1, data exchange between PIC and rho3, or PIC and process (process image) is performed on tha basis of the time-slot pattern of the ”clock” (which is set with machine parameter P5). On the rho3.2, data exchange is performed on the basis of the 10ms fixed time- of 10msslot pattern.

The PIC response time to process signals is 2 * time-slot pattern [in ms]. The PIC outputs to the process are copied from the PIC-output RAM to the output of the I/O card. The inputs of the I/O card are copied to the PIC-input RAM. In addition, data are exchanged between RC inputs/outputs and PHG signals at one end and the PIC-input/output RAM at the other. The input signals (RC inputs) are also generated in this time-slot pattern.

Furthermore, the markers for the PIC timers and counters are updated, and the retentive markers (marker 0..511, PIC address M0.0–M63.7) are stored in the buffered system RAM, in the above time-slot pattern. The range of the non-retentive markers (markers 512—1023, PIC address M64.0–127.7) remains unchanged.

No process image is generated if there is no supply voltage (24 V) for the inputs and outputs of the I/O card.

If the output signal test is active (operating mode: Diagnosis, sub-mode 9), the outputs are set directly by the output signal test. The PIC250 continues to run during this test. Only output from the PIC250 to the outputs is suppressed.

The time between two updates routed to the RC is monitored. For safety reasons, the READY contact is opened if no further input signals are signalled to the rho3 within 250ms.

2.2 With bit coupler

If the bit coupling card is used (instead of the I/O card) to interface the rho3 with a CL300 or PC600, the time-slot pattern for the process image is determined by the PLC. The RC inputs are generated in the time-slot pattern of the PLC. Data exchange from/to the rho3 occurs in the interrupt mode. When interfaced with the CL300, data are compressed/expanded for data exchange with rho3.

The following times must be maintained for signal exchange with the rho3:

PLC interrupt request (PLC program runtime)
Minimum time 2ms, maximum time 250 ms

The READY contact is opened if the maximum time is exceeded.

3 Temporal Sequence of Signal Exchange with ”High-speed I/Os”

If ”high-speed I/O’s” are used (see Option description), refer to 2.1 for the temporal sequence for generating the process image for ”normal” I/O’s. The inputs and outputs defined as ”high-speed” (by means of machine parameter P17 or P18) are read from the I/O card(s) or written to the I/O card(s), directly bypassing the PIC. At the same time, these inputs are copied to the PIC input table and to the RC inputs (information for PIC, and/or signal states under Diagnostic signals).

The ”high-speed” outputs are written directly to the I/O card(s), bypassing the PIC, and, at the same time, are copied to the PIC input RAM (internal input table) and to the RC outputs (signal states: Diagnostic signals).

”High-speed” I/O’s can only be defined in a continuous range, starting at the end.

If ”high-speed I/O’s are used, note that the RC inputs/outputs defined as ”high-speed” can be used twice; i.e., the same integer/PPA signals of the RC-internal interface can be used for high-speed PPA’s and at the same time for ”normal” INTEGER outputs.

4 Signal Descriptions, Dependencies

The sequential bit number (BAPS–PIC signal number), the respective PIC address as well as the addresses of the PLC coupling (PC600, CL300), and the byte.bit number as addressed under Diagnosis (sub-mode 6 and 7) are each listed. Cross-references withing the signal descriptions always refer to the bit number (item number) for the inputs or outputs.

5 PIC250 Inputs

5.1 PHG outputs (key signals)

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
0	E 0.0	E 0.0	E 0.0		1.1	**Dead man's button**
1 . 7	E 0.1 . E 0.7	E 0.1 . E 0.7	E 0.1 . E 0.7		1.2 . 1.8	**free** **"** **"**
8	E 1.0	E 1.0	E 1.0		2.1	**" 0 Z @ key "**
9	E 1.1	E 1.1	E 1.1		2.2	**" 1** ← **! key "**
10	E 1.2	E 1.2	E 1.2		2.3	**" 2 Y** / **key "**
11	E 1.3	E 1.3	E 1.3		2.4	**" 3** → **% key "**
12	E 1.4	E 1.4	E 1.4		2.5	**" 4 W + key "**
13	E 1.5	E 1.5	E 1.5		2.6	**" 5** ↑ *** key "**
14	E 1.6	E 1.6	E 1.6		2.7	**" 6 X : key "**
15	E 1.7	E 1.7	E 1.7		2.8	**" 7 S** < **key "**
16	E 2.0	E 2.0	E 2.0		3.1	**" 8 T key "**
17	E 2.1	E 2.1	E 2.1		3.2	**" 9 U JOG 6+ key "** Manual traverse in positive direction; start referencing
18	E 2.2	E 2.2	E 2.2		3.3	**" – V JOG 6– key "** Manual traverse in negative direction; start referencing
19	E 2.3	E 2.3	E 2.3		3.4	**" ALT key "**
20	E 2.4	E 2.4	E 2.4		3.5	**" Shift key "**
21	E 2.5	E 2.5	E 2.5		3.6	**" .** ↓ **, key "**
22	E 2.6	E 2.6	E 2.6		3.7	**" DEL key "**
23	E 2.7	E 2.7	E 2.7		3.8	**" ENTER key "**

PHG outputs (key signals)

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
24	E 3.0	E 3.0	E 3.0		4.1	**” V_PTP/Q/5 + – key ”:** : Manual traverse in positive direction; start manual referencing
25	E 3.1	E 3.1	E 3.1		4.2	**” = /R/5– – key ”:** Manual traverse in negative direction; start manual referencing
26	E 3.2	E 3.2	E 3.2		4.3	**” REP_END/O/4 + – key ”:** Manual traverse in positive direction; start manual referencing
27	E 3.3	E 3.3	E 3.3		4.4	**HOLD/P/4 – – key ”:** Manual traverse in negative direction; start manual referencing
28	E 3.4	E 3.4	E 3.4		4.5	**” ELSE/K/3 + – key ”:** Manual traverse in positive direction; start manual referencing
29	E 3.5	E 3.5	E 3.5		4.6	**” JUMP/L/3 – – key ”:** Manual traverse in negative direction; start manual referencing
30	E 3.6	E 3.6	E 3.6		4.7	**” START/G/2 + – key ”:** Manual traverse in positive direction; start manual referencing
31	E 3.7	E 3.7	E 3.7		4.8	**” END/H/2 – – key ”:** Manual traverse in negative direction; start manual referencing

PHG outputs (key signals)

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
32	E 4.0	E 4.0	E 4.0		5.1	**" MODE/INFO/GROUP – key":** Selection of a PHG operating mode is started with MODE. Selection of a group when manual traversing. Selection of the INFO function, display of errors and information texts
33	E 4.1	E 4.1	E 4.1		5.2	**" COORD./KINEM./SPACE – key ":** Selection of the corresponding operating mode – World coordinates (WC) – Joint coordinates (JC) – Gripper coordinates (GC) – Coupling coordinates (CC) with manual traversing of the axes. Selection of kinematics
34	E 4.2	E 4.2	E 4.2		5.3	**" REP/M/(– key "**
35	E 4.3	E 4.3	E 4.3		5.4	**" TIMES/N/) – key "**
36	E 4.4	E 4.4	E 4.4		5.5	**" IF/I/[– key "**
37	E 4.5	E 4.5	E 4.5		5.6	**" THEN/J] – key "**
38	E 4.6	E 4.6	E 4.6		5.7	**" WAIT/E/? – key "**
39	E 4.7	E 4.7	E 4.7		5.8	**" UNTIL/F/' – key "**
40	E 5.0	E 5.0	E 5.0		6.1	**" MOVE/A/'_' – key "**
41	E 5.1	E 5.1	E 5.1		6.2	**" LINEAR/B/; – key "**
42	E 5.2	E 5.2	E 5.2		6.3	**" VIA/C/1 + – key "** Manual traverse in positive direction; start manual referencing
43	E 5.3	E 5.3	E 5.3		6.4	**" TO/D/1– – key "** Manual traverse in negative direction; start manual referencing
44 . 47	E 5.4 . E 5.7	E 5.4 . E 5.7	E 5.4 . E 5.7		6.5	Reserve PHG " " " "
48 . 63	E 6.0 . E 7.7	E 6.0 . E 7.7			6.6	Currently not used " " " "

5.2 RC outputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
64	E 8.0	E 8.0	E 6.0		1.1	**”INPOS all axes”:** Changes to ”1” when all applied axes are in position. The group signal is formed in the RC by AND-ing all individual Inpos signals.
65	E 8.1	E 8.1	E 6.1		1.2	**”Reference points must be approached!”:** Is ”1” until all axes have approached their reference point once. Changes from ”0” to ”1” (after start-up) at the moment following which the RC is ready for command inputs.
66	E 8.2	E 8.2	E 6.2		1.3	**”Control new-start”:** Is set to ”1” after RC start-up and remains in this state until the acknowledgement signal RC input, item no. 82, ”Acknowledgement for start-up signal” = ”1”, is signalled to the RC. Signal state ”1” is available in the first PIC cycle or during the first data exchange with a PLC.
67	E 8.3	E 8.3	E 6.3		1.4	**”Group alarm”:** Changes to ”1” if an error occures in the operating system (for example, servo error, EMERGENCY STOP, runtime error, etc.). If no further errors are pending, the signal reverts to ”0”.
68	E 8.4	E 8.4	E 6.4		1.5	**”Power reduction”:** Always set to ”1” in manual mode (RC input, item no. 23”Automatic/Set-up, not” is ”0”). In all other cases, the signal is set to ”1” if RC input, item no. 18, ”Emergency operation without RC”, is set or if ”TEST movement progam” is active. Can be used for power reduction in the drive booster.
69	E 8.5	E 8.5	E 6.5		1.6	**”Feed hold, not”:** Corresponds to the status of RC input, item no. 17, ”Feed hold, not”.
70	E 8.6	E 8.6	E 6.6		1.7	**”Power supply of the I/O card(s) missing”:** The supply voltage (24V) of the I/O card(s) or of the PC-I/O coupling card is monitored for presence. If it is absent (even only briefly), the RC opens the READY contact and the signal (RC output 70) is set to ”1”. When voltage is restored, the signal (RC output 70) changes back to ”0” with the ”Reset” command. There is no voltage monitoring if the RC bit coupling card for PC600/CL300 is installed.
71	E 8.7	E 8.7	E 6.7		1.8	**”Buffer battery voltage too low”:** This is set to ”1” after start-up of the RC if, on the rho 3.1 (CP/Mem4), the voltage of the buffer battery (located in the cover of the EPROM module plug-in unit) is less than 3.2 V. Otherwise the signal is ”0”. The battery test is conducted at start-up and cyclically thereafter approx. every 24 hours. On the rho 3.2 (CP2.5 with Mem5), both buffer batteries G1 + G2 (located behind the cover of the Mem5) are tested at start-up and cyclically thereafter approx. every 10 seconds. <u>Note:</u> The cyclical test is only performed if the basic level of the PHG operator interface is active (RC output 104 = ”1”).

RC outputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
72	E 9.0	E 9.0	E 7.0		2.1	**”PHG is active in Set-up”:** The power-up state is ”0” after start-up. It changes to ”1” if any key on the PHG is pressed in the main operating mode ”Set-up”. The signal changes to ”0” when mode 8, ”Automatic enable”, is selected. In the main operating mode ”Automatic” this signal (RC output 72) remains ”0”. This signal can be used to prevent unintentional switch-over to Automatic (when PHG is active; so implemented in the standard reach-through program):
73	E 9.1	E 9.1	E 7.1		2.2	**”Operating panel is active”** The power-up state is ”0” after start-up. (in preparation)
74	E 9.2	E 9.2	E 7.2		2.3	**”PG is active”:** The power-up state is ”0” after start-up. (in preparation)
75	E 9.3	E 9.3	E 7.3		2.4	**”Auxiliary device is active”:** The power-up state is ”0” after start-up. (in preparation)
76	E 9.4	E 9.4	E 7.4		2.5	**”PHG not connected or defective”:** During runtime, the rho3 checks whether an operable PHG is connected to the PHG interface X22. If no PHG is connected or if no data can be transmitted to or received from the PHG, this signal (RC output 76) = ”1”. If changes back to ”0” after connection of an operable PHG. Intended for checking the functioning of the dead man’s button in order to increase safety.
77	E 9.5	E 9.5	E 7.5		2.6	**”Operating panel not connected or defective”:** (in preparation)
78	E 9.6	E 9.6	E 7.6		2.7	**”PG not connected or defective”:** (in preparation)
79	E 9.7	E 9.7	E 7.7		2.8	**”Auxiliary device not connected or defective”:** (in preparation)

RC outputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
80	E 10.0	E 10.0	E 8.0		3.1	**”Operating mode KINEMATIC SELECTION has been selected”:** Currently not used
81	E 10.1	E 10.1	E 8.1		3.2	**”Operating mode Referencing has been selected”:** The signal changes to ”1” if operating mode ”Referencing” has been selected on the PHG (mode 1) or via tha RC input, item no. 51 ”Referencing”. The signal (RC output 81) reverts to ”0” when ”Referencing” is quit.
82	E 10.2	E 10.2	E 8.2		3.3	**”Operating mode MANUAL has been selected”:** The signal changes to ”1” if operating mode ”Manual” has been selected on the PHG (mode 2) or via tha RC input, item no. 50, ”Manual mode” =1. The coordinate system and the group may not be selected until this point. The signal (RC output 82) reverts to ”0” when ”Manual” is quit.
83	E 10.3	E 10.3	E 8.3		3.4	**”Operating mode TEST has been selected”:** Changes to ”1” if operating mode ”TEST BAPS” has been selected in SET-UP on the PHG (mode 5). The signal reverts to ”0” when the operating mode is quit.
84	E 10.4	E 10.4	E 8.4		3.5	**”Operating mode Joint coordinates (JC) has been selected”:** The RC sets this signal to ”1” when the RC input 72, joint coordinates (JC), and RC input 70, External coordinate selection, is set.
85	E 10.5	E 10.5	E 8.5		3.6	**”Operating mode World coordinates (WC) has been selected”:** The RC sets this signal to ”1” when the RC input 73, World coordinates (WC), and RC input 70, External coordinate selection, is set. The precondition is all axes have reached their reference point beforehand.

RC outputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
86	E 10.6	E 10.6	E 8.6		3.7	**”Operating mode Gripper coordinate (GC) has been selected”:** The RC sets this signal to ”1” when the RC input 74, Gripper coordinate (WC), and RC input 70, External coordinate selection, is set. The precondition is all axes have referenced. (currently set only in case of external coordinate selection)
87	E 10.7	E 10.7	E 8.7		3.8	**”Operating mode Coupling coordinate (CC) has been selected”:** (in preparation)
88	E 11.0	E 11.0	E 9.0		4.1	**”Operating mode DIAGNOSIS has been selected”:** Is ”1” as long as Diagnosis (mode 7) is selected on the PHG.
89	E 11.1	E 11.1	E 9.1		4.2	**”Operating mode PROGRAMMING (Movement/Sequence)”:** Is ”1” as long as mode 3 is selected on the PHG.
90	E 11.2	E 11.2	E 9.2		4.3	**”Operating mode Define/Teach”:** Is ”1” as long as mode 4 is selected on the PHG.
91	E 11.3	E 11.3	E 9.3		4.4	Currently not used
92	E 11.4	E 11.4	E 9.4		4.5	Currently not used
93	E 11.5	E 11.5	E 9.5		4.6	Currently not used
94	E 11.6	E 11.6	E 9.6		4.7	Currently not used
95	E 11.7	E 11.7	E 9.7		4.8	Currently not used

RC outputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
96	E 12.0	E 12.0	E 10.0		5.1	**”AUTOMATIC SET-UP, not”:** Corresponds to the status of RC input signal (item no. 23), ”Automatic/Set-up, not”.
97	E 12.1	E 12.1	E 10.1		5.2	**”TEST/MANUAL, not”:** Corresponds to the status of RC input signal (item no. 22), ”Test/Manual, not” provided switch-over to Set-up has taken effect. In the operating mode Automatic, the signal is permanently set to ”0”.
98	E 12.2	E 12.2	E 10.2		5.3	**”Dry run test”:** Signal is ”1” if ”dry run” is active under TEST; otherwise ”0”.
99	E 12.3	E 12.3	E 10.3		5.4	Currently not used
100 . . 103	E 12.4 . . E 12.7	E 12.4 . . E 12.7	E 10.4 . . E 10.7		5.5 . . 5.8	**”Control variant coding, bit 0–3 (significance 1 – 8)”:** Coding the control variant Coding = 1 corresponds to rho 3.1 Coding = 2 corresponds to rho 3.2
104	E 13.0	E 13.0	E 11.0	TO04H	6.1	**”Basic menu level active”:** Set to ”1” by the RC as long as the operating system is in the basic level. Selection of Manual and Referencing is possible. In addition, a coded PHG function selection is possible in this state.
105	E 13.1	E 13.1	E 11.1		6.2	**”Non–permanent process active”:** Set to ”1” by the RC for as long as at least one ”normal” process is active. The signal is reset to ”0” when a ”normal” process is no longer active, for example in Control reset, or when Stop is initiated by another process, or if the PHG is operated. The signal is only set to ”1” if a process has been started. Selection alone is not sufficient (only leads to the message ”Process active” under Diagnosis, System States, Process States).
106	E 13.2	E 13.2	E 11.2		6.3	**”Permanent process is active”:** Set to ”1” by the RC for as long as at least one ”permanent” process is active. The signal is reset to ”0” when a ”permanent” process is no longer active, for example in Control reset, or when Stop is initiated by another process, or if the PHG is operated. The signal is only set to ”1” if a process has been started. Selection alone is not sufficient (only leads to the message ”Process active” under Diagnosis, System States, Process States). Aborting a ”permanet” process can be prevented by setting the RC input (item no. 61) ”Permanent process is to remain active”.
107	E 13.3	E 13.3	E 11.3	TO01I	6.4	**”Control is ready”:** Set to ”1” by the RC if the operating system is ready for external program selection or Auto start. The signal remains ”1” until the next RC start-up.

RC outputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
108	E 13.4	E 13.4	E 11.4		6.5	**”Acknowledgement, coded text output”:** Strobe signal; set if it has been possible to output the selected text without errors. The period can be set with with machine parameter P9; the default time is 110ms.
109	E 13.5	E 13.5	E 11.5		6.6	**”Error in coded text output”:** Strobe signal; set if it has not been possible to output the selected text (output channel occupied, no text exists for the selected number). The period can be set with with machine parameter P9; the default time is 110ms.
110	E 13.6	E 13.6	E 11.6		6.7	**””Program selection was correct”:** Strobe signal; default time is 110ms (can be changed with machine parameter P9). Is set if: a) RC input item no. 20 ”Automatic restart” (INIT.IRD) has been selected correctly b) External program selection has occurred correctly c) Program selection has been performed correctly with the PHG d) Correct program selection has occurred by means of the online functions. If this signal is to be used to perform an automatic start (RC input 21 = 1), either the negative edge of this signal, or the ”Program start” should be delayed for reasons of safety. The delay time depends on system utilization by active processes.
111	E 13.7	E 13.7	E 11.7		6.8	**”Error in program selection”:** Strobe signal; default time is 110ms (can be changed with machine parameter P9). Is set if: a) A non–permanent process has been selected under Set–up b) A non-permanent process is selected in case of EMERGENCY STOP or EMERGENCY MODE c) An existing process has been reselected or the selected program is not in memory d) Ext. program selection was made without EXPROG.DAT e) Ext. program selection was made with illegal parity (can be set with machine parameter P4) f) Illegal call-up of INIT.IRD or if INIT.IRD does not exist and is called by means of RC input item no. 20 ”Automatic restart” g) Online function was used to make an invalid program selection In addition, a corresponding error code is output via the coded error output (RC output 118, 119, and 152–167).
112	E 14.0	E 14.0	E 12.0		7.1	**”Control reset selected on PHG”:** Strobe signal with selectable time (machine parameter P9). The signal changes to ”1” if the sub-mode ”Control reset” (mode 1) has been selected on the PHG in the operating mode ”Auxiliary functions” (mode 11). This signal (RC output 112) also changes to ”1” in order to verify that the control has correctly recognized the RC input, item no. 19, ”Control reset”, and performs the Control reset. Note: If processes are aborted with Control reset, the abort operation is only valid if the RC output 105 or 106 is ”0”, and thus reselectable.

RC outputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
113	E 14.1	E 14.1	E 12.1		7.2	**”PROGRAM END / STOP command has been recognized”:** This changes to ”1” if the ”PROGRAM END” or ”STOP” command is being executed in the BAPS program; i.e., the end of the program is reached. It changes to ”0” with program start (RC input 21, PIC address A 2.5).
114	E 14.2	E 14.2	E 12.2		7.3	**”PAUSE command has been recognized”:** This changes to ”1” if the ”PAUSE” command without coding” is being executed in the BAPS program. It changes to ”0” with program start (RC input 21, PIC address A 2.5) and the signal is reset to ”0”.
115	E 14.3	E 14.3	E 12.3		7.4	**”MZA display has been activated”:** This is set to ”1” by the RC if one of the two display modes has been activated under PHG DIAGNOSIS (mode 7) in sub-mode ”Machine states” (mode 12). It is reset to ”0” when mode 12 is quit again.
116	E 14.4	E 14.4	E 12.4	TO02F	7.5	**”Strobe, process has been aborted with external process abort”:** Changes to ”1” for the time set (default 110ms) with the machine parameter P9 if the selected process could not be successfully aborted.
117	E 14.5	E 14.5	E 12.5	TO02F	7.6	**”Strobe, error with external process abort”:** Changes to ”1” for the time set (default 110ms) with the machine parameter P9 if the selected process could not be successfully aborted. Possible causes are: a) Process is not active or does not exist b) The file EXPROG.DAT does not exist or external process abort was performed without valid EXPROG.DAT file c) Data channel parity does not agree with the parity set with machine parameter P4.
118	E 14.6	E 14.6	E 12.6	TO02F	7.7	**”Strobe for coded error output”:** This changes to ”1” for the time which can be selected via machine parameter P9 (default 110ms) when a runtime error is output in coded form to the RC outputs, item no. 152–167, ”Coded error output bit 0–15, significance 1–65535” to the interface.
119	E 14.7	E 14.7	E 12.7		7.8	**”Parity for coded error output”:** Even parity is the internal default. The signal is set accordingly.

RC outputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
120	E 15.0	E 15.0	E 13.0		8.1	**”Incrementel JOG dimension small”:** This is set in case of internal speed preselection (in manual mode) if ”Incremental dimension small” has been selected. In case of external selection, copy of the RC input, item no. 78 ”Incremental dimension small”.
121	E 15.1	E 15.1	E 13.1		8.2	**”Incrementel JOG dimension large”:** This is set in case of internal speed preselection (in manual mode) if ”Incremental dimension large” has been selected. In case of external selection, copy of the RC input, item no. 79 ”Incremental dimension large”.
122	E 15.2	E 15.2	E 13.2		8.3	**”Continuous JOG slow”:** This is set in case of internal speed preselection (in manual mode) if ”Slow” has been selected. In case of external selection, copy of the RC input, item no. 76 ”Manual feed slow”.
123	E 15.3	E 15.3	E 13.3		8.4	**”Continuous JOG fast”:** This is set in case of internal speed preselection (in manual mode) if ”Fast” has been selected. In case of external selection, copy of the RC input, item no. 77 ”Manual feed fast”.
124 . . 127	E 15.4 . . E 15.7	E 15.4 . . E 15.7	E 13.4 . . E13.7	TO03	8.5 . . 8.8	**”Machine configuration, bit 0–3 (significance 1–8)”:**

RC outputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
128	E 16.0	E 16.0	E 14.0	TO05D	9.1	**”Control reset via PG”:** (from ROPS3–Version W3A) This is set if the function ”Control reset RC” is selected with the ROPS. Has not direct function in the RC. This can by implemented by the user as desired in the PIC250/PLC program (for example, Control reset RC or machine, etc.).
129	E 16.1	E 16.1	E 14.1	TO05D	9.2	**”RC Start via PG”:** (from ROPS3–Version W2C) This is set via the function ”Program start” in the ROPS and then reset approx. 200ms later. Can be interfaced in the RC with the RC input 21 (”Programm start”, PIC address A2.5) in order to start programmes.
130	E 16.2	E 16.2	E 14.2		9.3	Currently not used
131	E 16.3	E 16.3	E 14.3		9.4	Currently not used
132	E 16.4	E 16.4	E 14.4		9.5	Currently not used
133	E 16.5	E 16.5	E 14.5		9.6	Currently not used
134	E 16.6	E 16.6	E 14.6		9.7	Currently not used
135	E 16.7	E 16.7	E 14.7		9.8	Currently not used
136 . . 143	E 17.0 . . E 17.7	E 17.0 . . E 17.7	E 15.0 . . E 15.7	TO05D	10.1 . . 10.8	**”Output 1–8 from the PG”:** (from ROPS3–Version W3A) These outputs can be set with the Offline programming system or with the Online functions.

RC outputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
144 . . 151	E 18.0 . . E 18.7	E 18.0 . . E 18.7	E 16.0 . . E 16.7		11.1 . . 11.8	**”I2 T limitation, axis 1–8”:** This is set in case of axis control via CAN when the correspoinding status is signalled by the drive booster via the CAN interface (motor temperature greater than 130 °C or bridge temperature greater than 70 °C).
152 167	E 19.0 . . . . E 20.7	E 19.0 . . . . E 20.7	E 17.0 . . . . E 18.7	TO02F	12.1 . . . . 13.8	**”Coded error output bit 0 – 15, significance 1 – 256”:** All runtime errors, i.e., errors which abort a running program, and errors which occur during controller operations (servo errors, I/O voltage, PLC time errors, etc.) are output in binary code to the interface. The data are valid for the duration of the strobe signal (RC output 118). If several errors occur simultaneously, or if, for example, servo errors occur in more than one axis, all errors are output in code one after the other (see appendix, ”Coded error messages”).
168 175	E 21.0 . . . . E 21.7	E 21.0 . . . . E 21.7	E 19.0 . . . . E 19.7		14.1 . . . . 14.8	**”Selection group 1–8”:** In case of oerating mode selection ”Referencing has been selected” (RC output item no. 81 = ”1”) or operating mode selection ”Manual has been selected” (RC output, item no. 82 = ”1”), a group selection must also be made in order to permit a traverse movement to be triggered. The bit which corresponds to the group no. selected with the PHG is set to ”1” by the RC. All other bits are set to ”0” by the RC. The set group bit, in the PLC program, serves to assign the Jog key pressed on the PHG to the correct Jog signal with the RC inputs, item nos. 280–331.
176 . 183	E 22.0 . E 22.7	E 22.0 . E 22.7			15.1 . 15.8	**”Selection group 9–16”:** see Selection group 1–8
184 . 191	E 23.0 . E 23.7	E 23.0 . E 23.7	E 20.0 . E 20.7		16.1 . 16.8	**”I/O logic output 1.8”:** These signals can be influenced via the special function 1.
192 . 199	E 24.0 . E 24.7	E 24.0 . E 24.7			17.1 . 17.8	Currently not used Currently not used
200 . . 207	E 25.0 . . E 25.7	E 25.0 . . E 25.7	E 21.0 . . E 21.7	TO05D	18.1 . . 18.8	**”I2 T limitation, axis 9–12”:** This is set in case of axis control via CAN when the corresponding status is signalled by the drive booster via the CAN interface (motor temperature >130 °C, or bridge temperature > 70 °C).
208 . . 215	E 26.0 . . E 26.7	E 26.0 . . E 26.7			19.1 . . 19.8	Currently not used Currently not used
216 . . 223	E 27.0 . . E 27.7	E 27.0 . . E 27.7			20.1 . . 20.8	Currently not used Currently not used

RC outputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
224 . . . 239	E 28.0 . . . E 29.7	E 28.0 . . . E 29.7	E 22.0 . . . E 23.7		21.1 . . . 22.8	**”INPOS 1st–16th axis”:** If the signal is ”1”, the corresponding axis (1..16) is ”in-position” meaning that the current lag (following error) is less than the in-position range set via machine parameter P201.
240 . . . 243	E 30.0 . . . E 30.3	E 30.0 . . . E 30.3			23.1 . . . 23.4	**”INPOS 17th–20th axis”:** If the signal is ”1”, the corresponding axis is ”in-position” meaning that the current lag (following error) is less than the in-position range set via machine parameter P201.
244 . . 247	E 30.4 . E 30.7	E 30.4 . E 30.7			23.5 . . 23.8	”Reserved” ” ” ”Reserved”
248 . 263	E 31.0 . . E 32.7	E 31.0 . . E 32.7	E 24.0 . . E 25.7		24.1 . . 25.8	**”Traverse command 1st axis – 16th axis plus”**: The signal is ”1” if the traverse direction of the corresponding axis is positive. Traverse commands in manual mode and in automatic mode are partially different. <u>Manual mode:</u> The traverse commands are cleared if ”Feed HOLD” (RC input 17) becomes ”0”, or if ”Drive on, all axis” (RC input 66) or a corresponding individual signal becomes ”0”. For ”Emergency mode without RC” (RC input 18) ”1”, ”EMERGENCY STOP” (RC input 16) ”0” and ”Controller enable, all axis” (RC input 68) ”0”, the traverse commands remain until the deadman’s button on the PHG is released. If ”Feed enable, all axis” (RC input 67) becomes ”0”, the traverse commands remain present. <u>Automatic mode</u> If ”Feed hold” (RC input 17) or ”Feed enable, all axis” (RC input 67) become ”0”, the traverse commands remain present. For ”Emergency mode without RC” (RC input 18) ”1”, ”EMERGENCY STOP” (RC input 16) ”0” and ”Controller enable, all axis” (RC input 68) ”0” or ”Drive on, all axis”, or one of the corresponding signals ”0”, traverse commands are cleared.
264 . 267	E 33.0 . . E 33.3	E 33.0 . . E 33.3			26.1 . . 26.4	**”Traverse command 17th–20th axis plus”:** The signal is ”1” if the traverse direction of the corresponding axis is positive. For signal behavior, see ”Traverse command 1st axis–16th axis plus”
268 . . 271	E 33.4 . . E 33.7	E 33.4 . . E 33.7			26.5 . . 26.7	”Reserved” ” ” ”Reserved”
272 . . 287	E 34.0 . . E 35.7	E 34.0 . . E 35.7	E 26.0 . . E 27.7		27.1 . . 28.8	**”Traverse command 17th–20th axis minus”:** The signal is ”1” if the traverse direction of the corresponding axis is negative. For signal behavior, see ”Traverse command 1st axis–16th axis plus”

RC outputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
288 . . 291	E 36.0 . . E 36.3	E 36.0 . . E 36.3			29.1 . . 29.4	**”Traverse command 17th axi – 20th axis minus”:** The signal is ”1” if the traverse direction of the corresponding axis is negative. For signal behavior, see ”Traverse command 1st axis–16th axis plus”.
292 . . 295	E 36.4 . . E 36.7	E 36.4 . . E 36.7			29.5 . . 29.8	”Reserved” ” ” ”Reserved”
296	E 37.0	E 37.0	E 28.0		30.1	”Parity, word output 1+2 (in preparation)”:
297	E 37.1	E 37.1	E 28.1		30.2	”Parity, word output 3+4 (in preparation)”:
298	E 37.2	E 37.2	E 28.2		30.3	”Parity, word output 5+6 (in preparation)”:
299	E 37.3	E 37.3	E 28.3		30.4	”Parity, word output 7+8 (in preparation)”:
300	E 37.4	E 37.4	E 28.4		30.5	”Parity, integer output 1+2+3+4 (in preparation)”:
301	E 37.5	E 37.5	E 28.5		30.6	”Parity, integer output 5+6+7+8 (in preparation)”:
302	E 37.6	E 37.6	E 28.6		30.7	Currently not used
303	E 37.7	E 37.7	E 28.7		30.8	Currently not used
304 . 311	E 38.0 . E 38.7	E 38.0 . E 38.7	E 29.0 . E 29.7		31.1 . 31.8	**”Parity, byte/PPA output 1 – 8”:** Even parity is the internal default. The signal is set accordingly. The signal is valid for integer outputs 401..408 and process parameter 1..8
312	E 39.0	E 39.0	E 30.0		32.1	”Strobe, word output 1+2 (in preparation)”:
313	E 39.1	E 39.1	E 30.1		32.2	”Strobe, word output 3+4 (in preparation)”:
314	E 39.2	E 39.2	E 30.2		32.3	”Strobe, word output 5+6 (in preparation)”:
315	E 39.3	E 39.3	E 30.3		32.4	”Strobe, word output 7+8 (in preparation)”:
316	E 39.4	E 39.4	E 30.4		32.5	”Strobe, integer output 1+2+3+4 (in preparation)”:
317	E 39.5	E 39.5	E 30.5		32.6	”Strobe, integer output 5+6+7+8 (in preparation)”:
318	E 39.6	E 39.6	E 30.6		32.7	Currently not used
319	E 39.7	E 39.7	E 30.7		32.8	Currently not used
320 . 327	E 40.0 . E 40.7	E 40.0 . E 40.7	E 31.0 . E 31.7		33.1 . 33.8	**”Strobe, byte/PPA output 1 – 8”:** Default time 110 ms, can be set with machine parameter P9. The signal is valid for integer outputs 401..408 and process parameter 1..8

RC outputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
328 . . 335	E 41.0 . . E 41.7	E 41.0 . . E 41.7	E 32.0 . . E 32.7		34.1 . . 34.8	**”Output integer: 401: / PPA output 1** **Bit 0–7, significance 1–128”:** Integer output or process parameter output can be addressed as a channel from BAPS.
336 . . 343	E 42.0 . . E 42.7	E 42.0 . . E 42.7	E 33.0 . . E 33.7		35.1 . . 35.8	**”Output integer: 402: / PPA output 2** **Bit 0–7, significance 1–128”:** Integer output or process parameter output can be addressed as a channel from BAPS.
344 . . 351	E 43.0 . . E 43.7	E 43.0 . . E 43.7	E 34.0 . . E 34.7		36.1 . . 36.8	**”Output integer: 403: / PPA output 3** **Bit 0–7, significance 1–128”:** Integer output or process parameter output can be addressed as a channel from BAPS.
352 . . 359	E 44.0 . . E 44.7	E 44.0 . . E 44.7	E 35.0 . . E 35.7		37.1 . . 37.8	**”Output integer: 404: / PPA output 4** **Bit 0–7, significance 1–128”:** Integer output or process parameter output can be addressed as a channel from BAPS.
360 . . 367	E 45.0 . . E 45.7	E 45.0 . . E 45.7			38.1 . . 38.8	**”Output integer: 405: / PPA output 5** **Bit 0–7, significance 1–128”:** Integer output or process parameter output can be addressed as a channel from BAPS.
368 . . 375	E 46.0 . . E 46.7	E 46.0 . . E 46.7			39.1 . . 39.8	**”Output integer: 406: / PPA output 6** **Bit 0–7, significance 1–128”:** Integer output or process parameter output can be addressed as a channel from BAPS.
376 . . 383	E 47.0 . . E 47.7	E 47.0 . . E 47.7			40.1 . . 40.8	**”Output integer: 407: / PPA output 7** **Bit 0–7, significance 1–128”:** Integer output or process parameter output can be addressed as a channel from BAPS.
384 . . 391	E 48.0 . . E 48.7	E 48.0 . . E 48.7			41.1 . . 41.8	**”Output integer: 408: / PPA output 8** **Bit 0–7, significance 1–128”:** Integer output or process parameter output can be addressed as a channel from BAPS.
392 463	E 49.0 . . . . E 57.7	E 49.0 . . . . E 57.7	E 36.0 . . . . E 44.7		42.1 . . . . 50.8	**”User output 1 – 72”:** These binary interface signals can be set and reset from BAPS. Machine parameter P24 can be used to establish up to which output (inclusive) the user outputs for ”Control reset” or ”Reset” should be deleted. (Signal status ”0”)
464 511	E 58.0 . . . . E 63.7	E 58.0 . . . . E 63.7			51.1 . . . . 56.8	**”User output 73 – 120”:** These binary interface signals can be set and reset from BAPS. Machine parameter P24 can be used to establish up to which output (inclusive) the user outputs for ”Control reset” or ”Reset” should be deleted. (Signal status ”0”)

5.2.1 Inputs from the panel (panel keys)

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
512	E 64.0	E 64.0				Panel key 1 (currently not used)
.	.	.				”
.	.	.				”
.	.	.				”
.	.	.				”
639	E 79.7	E 79.7				Panel key 128 (currently not used)

5.2.2 Inputs from the MTB (MTB inputs)

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
640	E 80.0	E 80.0				MTB input 1 (currently not used)
.	.	.				” ”
.	.	.				” ”
.	.	.				” ”
.	.	.				” ”
703	E 87.7	E 87.7				MTB input 64 (currently not used)

5.2.3 Digital inputs from the I/O card, assignment standard PIC program

Item no.	PIC addr.	appl.as of vers.	Byte. bit	Signal description
704 . 711	E 88.0 . E 88.7		1.1 . 1.8	**”Reference point switches, 1st to 8th axis”:** The operability of the switches is defined with machine parameters P402 and P403.
712	E 89.0		2.1	**”Reset on interface”:** Triggers Control reset in the RC. Same effect as Control reset by means of PHG or online function (see description of RC input 61).
713	E 89.1		2.2	**”EMERGENCY STOP, not”:** The signal generates EMERGENCY STOP internally (see description of RC input 16).
714	E 89.2		2.3	**”Feed hold, not”:** After cancellation, all axis movements are stopped with the Slope function.
715	E 89.3		2.4	**”Feed enable all axes”:** Enables movement for all axes. If the signal is cancelled during an axis movement, the movement is stopped with the slope function (see description of RC input 67).
716	E 89.4		2.5	**”Controller enable all axes”:** Group signal for controller enable of the drive boosters. In case of signal state ”1”, the servo loop of the RC is closed; in case of signal state ”0”, it is open; the RC issues no setpoint voltage (see description of RC input 68).
717	E 89.5		2.6	**”Traverse enable all kinematics”:** Enables the traverse blocks in case of signal level ”1”. Does not act in case of arithmetic operations (see description of RC input 64),
718	E 89.6		2.7	**”Emergency mode”:** If the signal level is ”1”, the control loop of the RC is opened and the axis positions are slaved internally when the axes are moved externally. The current positions are used as the actual position when emergency mode is deactivated. The means that no ”jerk” occurs when switching on the power section of the drive amplifiers.
719	E 89.7		2.8	**”AUTOMATIC SET-UP, not”:** Mode selector switch for the two main operating modes, AUTOMATIC and SET-UP.
720	E 90.0		3.1	**”Cycle start”:** Start of user programs (*.IRD); is copied in the PIC program to RC input 21, ”Program start”.
721	E 90.1		3.2	**”TEST/MANUAL, not”:** If the signal level is ”1”, selection of the BAPS test system is permitted.

Digital inputs from the I/O card, assignment standard PIC program

Item no.	PIC addr.	appl.as of vers.	Byte. bit	Signal description
722	E 90.2		3.3	**”Auto start”:** Selection of program INIT.IRD until all reference points have been approached. The actual start of the program occurs with cycle start (program start).
723	E 90.3		3.4	**”Strobe external program selection”:** Acceptance of the HEX-coded program number applied to inputs E90.4–E90.7. The signal should be pending for at least 100ms.
724 . . 727	E 90.4 . . E 90.7		3.5 . . 3.8	**”External program selection data, bit 1–4 (bit significance 1 – 8)”:** The high-order 4 bits are set to ”0” in the standard PIC program. This allows 16 different programs to be called, coding ’00’H – ’0F’H.
728 . 735	E 91.0 E 91.7		4.1 . 4.8	**”Process input 1–8”:** Freely usable inputs for evaluating machine states.
736 . 743	E 92.0 . E 92.7		5.1 . 5.8	**”Process input 9–16”:** Freely usable inputs for evaluating machine states.
744 . . 751	E 93.0 . . E 93.7		6.1 . . 6.8	**”User inputs 1 – 8”** Interface signals which can be addressed from BAPS. They are copied in the PIC program directly to the RC inputs, item no. 464–471, ”User input 1–8”.
752 . . 759	E 94.0 . . E 94.7		7.1 . . 7.8	**”User inputs 9 – 16”** Interface signals which can be addressed from BAPS. They are copied in the PIC program directly to the RC inputs, item no. 472–479, ”User input 9–16”.
760 . . 767	E 95.0 . . E 95.7		8.1 . . 8.8	**”User inputs 17 – 24”** Interface signals which can be addressed from BAPS. They are copied in the PIC program directly to the RC inputs, item no. 480–487, ”User input 17–24”.

6 PIC250 – Outputs

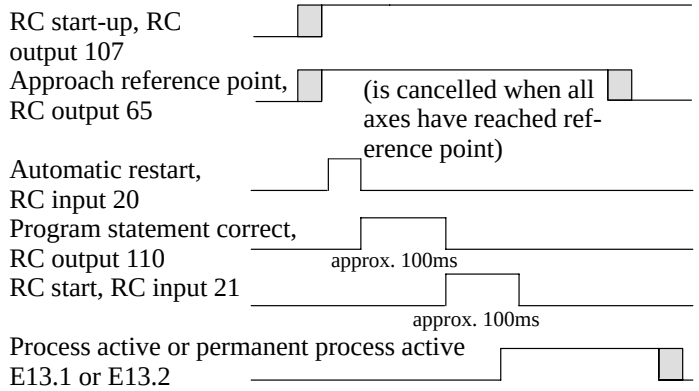
6.1 PHG inputs

Item no.	PIC address	PC600 address	CL300 address	applies as of version	Byte. bit	Signal description
0 . 7	A 0.0 . A 0.7	A 0.0 . A 0.7	A 0.0 . A 0.7			LED 1 – LED 8 (not used)
8 . 15	A 1.0 . A 1.7	A1.0 . A 1.7				LED 9 – LED 16 (not used)

6.2 RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
16	A 2.0	A 2.0	A 1.0	TO02F	1.1	**”EMERGENCY STOP, not”:** Signals to the RC the EMERGENCY STOP is pending. ”1” = no EMERGENCY STOP; ”0” = EMERGENCY STOP. A change from ”1” to ”0” aborts running programs (if these are ”normal” programs); the control loop in the RC is not opened. Permanent processes are not aborted if RC input 61 (PIC address A7.5) is on ”1”. For safety reasons, the EMERGENCY STOP signal can only be reset with Control reset.
17	A 2.1	A 2.1	A 1.1		1.2	**”FEED HOLD, not”:** Signals to the RC that Feed hold is pending. ”1” = no FEED HOLD, ”0” = FEED HOLD is active; i.e., no axis movements are permitted. Traverse commands of axes which were moved or which are intended for movement remain pending, or are issued. Does not act in case of arithmetic operations. When ”1” changes to ”0”, all axes which are moving are decelerated in a controlled manner (i.e., with slope). When changing from ”0” to ”1”, all axes whose movements have been interrupted continue to traverse.For reasons of safety, the signal should be programmed self-latching to ”0” in the PIC250 or in the PLC (acknowledgement after cancelling the status, for example with the Start key). The signal acts only on traverse blocks in a BAPS program, or in Manual mode.
18	A 2.2	A 2.2	A 1.2		1.3	**”Emergency mode without RC”:** ”1” opens the servo loop of all the axes and causes the positions of the axes to be slaved internally, for example in case of their external movement. Upon reconnection, these positions are used as the current positions, resulting in no jerk. An active program is aborted if a change from ”0” to ”1” occurs (if this is a ”normal” process). Permanent processes are not aborted if RC input 61 (PIC address A7.5) is on ”1”.
19	A 2.3	A 2.3	A 1.3		1.4	**”Control reset”:** An active program is aborted if a change from ”0” to ”1” occurs (if this is a ”normal” process). RC-internal buffers and variables are set to defined basic values. The ”gaps” resulting from recopying and deletion of files are elminated in the user memory and the files in the user memory are reordered. Error messages are reset provided the cause of the error has been corrected. Permanent processes are not aborted if RC input 61 (PIC address A7.5) is on ”1”.

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
20	A 2.4	A 2.4	A 1.4		1.5	**”Automatic restart (call INIT.IRD)”:** Program INIT.IRD can be initialized with this signal regardless of whether all reference points have been approached or not. If INIT.IRD has been declared as a permanent process, initialization is possible in set-up, and if errors are pending. The actual program start occurs by means of ”Program start”. This signal (RC input 20) is interpreted as Strobe signal. The example below illustrates the signal sequence with which an automatic restart can be achieved after power-up of the control. 
21	A 2.5	A 2.5	A 1.5		1.6	**”Program start”:** When a change occurs from ”0” to ”1”, this starts a previously selected (initialized) program. The signal must be signalled to the RC as a Strobe signal with a minimum time of 100ms. Under strong workload (e.g. several running processes) you have to increase this time.
22	A 2.6	A 2.6	A 1.6		1.7	**”TEST/MANUAL, not”:** Defines the set-up operating mode. ”1” = test mode permitted ”0” = test mode disabled
23	A 2.7	A 2.7	A 1.7	TO02F	1.8	**”AUTOMATIC SET-UP, not”:** Defines the main operating mode. ”1” = Automatic, ”0” = Set-up Changing from ”1” to ”0” aborts a running program or cancels initialization of a progam which has already begun. For reasons of safety, it should always be linked to signal RC output item no. 72, ”PHG is active in Set-up” (so implemented in the standard PIC). This signal has no meaning if RC input item no. 54 is set.

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
24	A 3.0	A 3.0	A 2.0		2.1	**”Disable: Manual selection with PHG”**: ”1” disables selection of operating mode ”Manual” (mode 2 on the PHG). If an attempt is made to select the operating mode, the message ”PHG function disabled” appears.
25	A 3.1	A 3.1	A 2.1		2.2	**”Disable BA: 4.1, 9.1, 11.4, 11.5 and 11.6”:** ”1” disables selection of sub-mode 1, ”Define” in PHG mode 4 (Define, Teach), ”Setting interface parametes” in PHG mode 9 (Device and File handling; Default), and changing ”VFACTOR”, ”AFACTOR” and ”DFACTOR” in PHG mode 11 (Auxiliary functions).
26	A 3.2	A 3.2	A 2.2		2.3	**”Disable: program movement program (mode 3.1)”:** In case of the signal ”1”, programming BAPS programs with the PHG is disabled.
27	A 3.3	A 3.3	A 2.3		2.4	**”Disable: program sequential program (mode 3.2)”:** In case of the signal ”1”, programming PIC programs with the PHG is disabled.
28	A 3.4	A 3.4	A 2.4		2.5	**”Disable: Device and File handling”:** In case of the signal ”1”, the operating mode Device and File handling on the PHG (mode 9) is disabled.
29	A 3.5	A 3.5	A 2.5	TO05D	2.6	**”Disable: program call under mode 10”:** In case of the signal ”1”, program handling, i.e. program selection (mode 10.1) and program deselection (mode 10.2), is disabled.
30	A 3.6	A 3.6	A 2.6		2.7	**”Disable: restart of the RC with PHG”:** In case of the signal ”1”, restart of the RC with the PHG is disabled.
31	A 3.7	A 3.7	A 2.7		2.8	**”Disable: PHG keys for RC”:** In case of the signal ”1”, all PHG keys for control are disabled. The signal acts in any operating mode, even in the middle of an entry. Nevertheless, the PHG keys are still signalled to the PIC250 or to a connected PLC. User-specific functions can then be performed with the PHG keys.

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
32	A 4.0	A 4.0	A 3.0		3.1	**”Disable: delete programs/modify PIC”:** In case of the signal ”1”, the functions for deleting user programs and modifying the PIC250 (PIC250 editor) are disabled.
33	A 4.1	A 4.1	A 3.1		3.2	**”Disable: Teach and Define (sub-mode of mode 4)”:** In case of the signal ”1”, points can neither be taught nor defined.
34	A 4.2	A 4.2	A 3.2		3.3	**”Disable: referencing with PHG”:** ”1” disables selection of operating mode ”Referencing” (mode 1 on the PHG). If an attempt is made to select the operating mode, the message ”PHG function disabled” appears on the PHG.
35	A 4.3	A 4.3	A 3.3		3.4	**”Output of system messages on PHG disabled”:** This prevents a coded message or user text (WRITE PHG...) from being overwritten by the RC.
36	A 4.4	A 4.4	A 3.4		3.5	**”Disable: referencing message”:** If the signal level is ”1”, the message ”Approach reference points!” or a blank text in line 3 of the basic PHG display is suppressed. This display can be used entirely for user texts.
37	A 4.5	A 4.5	A 3.5		3.6	**”Disable: online functions”:** Disables access via the online functions of the ROPS module. This affects the following functions: a) Load, copy to rho b) Delete c) Starting and stopping processes and setting signals
38 47	A 4.6 . . . . . A 5.7	A 4.6 . . . . . A 5.7	A 3.6 . . . . . A 4.7	TO02F	3.7 . . . . . 4.8	**”AUTOMATIC SET-UP, not”:** **Kinematics 1 - 10** Defines the main operating mode. ”1” = Automatic, ”0” = Set-up Changing from ”1” to ”0” aborts a running program or cancels initialization of a progam which has already begun. Only if RC input item no. 54 is set to 1.

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
48	A 6.0	A 6.0	A 5.0		5.1	Currently not used
49	A 6.1	A 6.1	A 5.1	TO04	5.2	**”Strobe coded PHG funtion selection”:** When the signal changes from ”0” to ”1”, the value present on the inputs ”Coded PHG function selection” is transferred to control. The relevant function is activated.
50	A 6.2	A 6.2	A 5.2		5.3	**”Manual mode”:** If the level is ”1”, this activates the operating mode Manual if the PHG keys are disabled. Normally, i.e. the selection of mode 2 on the PHG, this signal must be signalled to the RC in response to RC output item no. 82 ”Operating mode Manual has been selected” in order to permit Manual to be activated.
51	A 6.3	A 6.3	A 5.3		5.4	**”Referencing”:** If the level is ”1”, this activates the operating mode Referencing if the PHG keys are disabled. Normally, i.e. the selection of mode 1 on the PHG, this signal must be signalled to the RC in response to RC output item no. 81 ”Operating mode Referencing has been selected” in order to permit Referencing to be activated.
52	A 6.4	A 6.4	A 5.4		5.5	Currently not used
53	A 6.5	A 6.5	A 5.5		5.6	Currently not used
54	A 6.6	A 6.6	A 5.6	TO02F	5.7	**”Kinematic-dependent ”AUTOMATIC SET-UP, not”:** If the signal is ”1”, the signal item no. 23 has no meaning; in is replaced by signals item no. 38–47.
55	A 6.7	A 6.7	A 5.7		5.8	**”Automatic enable”:** At level ”1”, the RC allows change over to automatic mode. In the standard reach-through program, this signal is formed by inverting RC output 72, ”PHG is active in Set-up”. Can be used to disable automatic mode during conditioning.

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
56 . . 59	A 7.0 . . A 7.3	A 7.0 . . A 7.3	A 6.0 . . A 6.3	TO04	6.1 . . 6.4	**”Coded PHG function selection, bit 0–3 (significance 1–8)”:** The allocation of codes to the PHG functions is with file ***PHGKODE.DA***T (see TO04 options description)
60	A 7.4	A 7.4	A 6.4		6.5	**”MZA active display ON/OFF”:** Currently not used
61	A 7.5	A 7.5	A 6.5		6.6	**”Permanent processes are to remain active”:** If the signal state is ”1”, permanent processes are not stopped in case of Control reset or Automatic/Manual switchover.
62	A 7.6	A 7.6	A 6.6	TO03	6.7	**”Acknowledgement, error states”:** Signal change fro ”0” to ”1” resets the internal error buffer. The displayed runtime errors, warnings, and other errors are reset.
63	A 7.7	A 7.7	A 6.7		6.8	**”Dead man’s button from PHG”:** Must be set to ”1” if manual axis movements are desired.

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
64	A 8.0	A 8.0	A 7.0		7.1	**”Traverse enable all kinematics”:** If the signal is ”1”, the block processing logic of the control for all kinematics receives the enable signal for executing traversing blocks; i.e. traversing blocks are executed. If the signal is ”0”, traversing blocks already started are executed and completed. New traversing blocks are not activated. With appropriate linking in the PLC program, this allows, for instance, a ”Single-step mode” or ”Stop-at end of block” function to be implemented. This does not affect any arithmetic commands or logic operations. Instructions, for example WAIT UNTIL E=1, OUTPUT=O, etc., are only effected if preceded by a traverse instruction. The individual signals (RC input item no. 168–177) only work if this group signal is set to ”0”.
65	A 8.1	A 8.1	A 7.1	TO02F	7.2	Currently not used
66	A 8.2	A 8.2	A 7.2	TO02F	7.3	**”Drive-on all axes”:** If the signal is ”1”, all axes are in the servo loop. If the signal is ”0”, the internal axis positions are slaved and no servo errors occur if the axes are moved externally. After activation of ”Drive-on all axes”, the system continues starting with the current axis position. Whenever axis are to be moved without Drive-on, the error message ”Drive-on, no enable” is displayed. Additional information is provided in the manual ”*rho3 Options*”. The individual signals (RC input item no. 192–211) only work if this group signal is set to ”0”.
67	A 8.3	A 8.3	A 7.3		7.4	**”Feed enable, all axes”:** If the signal is ”1”, axis movements are permitted, if ”0”, movements are disabled. Active movements are aborted with ”down slope”. This signal overwrites the signals ”Feed enable 1–10 kinematic” (input item no. 240..249).
68	A 8.4	A 8.4	A 7.4	TO01I TO02F	7.5	**”Controller enable all axes”:** If the signal is ”1”, the servo loop of the RC is closed for all axes, while the signal ”0” opens the servo loop and aborts active (non-permanent) processes. Reselection of this program is blocked until ”Control reset” (RC input item no. 19) is activated. ”0” slaves the axis positions internally. This means that when the controller is enabled, there is no ”jump” to a setpoint.

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
69	A 8.5	A 8.5	A 7.5		7.6	Currently not used
70	A 8.6	A 8.6	A 7.6		7.7	**”External coordinate selection”:** If the signal state is ”1”, the control expects coordinate system selection to be carried out by means of RC inputs in Manual mode. This means the RC inputs – Joint coordinates (RC input 72), – World coordinates (RC input 73), – Gripper coordinates (RC input 74) and – Coupling coordinates (RC input 75) determine the coordinate system for all kinematics.
71	A 8.7	A 8.7	A 7.7		7.8	**”External speed selection for Manual”:** If this signal is ”1”, no automatic switchover incremental dimension ⇒ continuous or slow ⇒ fast is carried out during manual traversing. Signals RC inputs item nos. 76, 77, 78, and 79 act directly. If this signal is ”0”, an incremental dimension must be signalled back to the RC (RC input item no. 78 or no. 79).
72	A 9.0	A 9.0	A 8.0		8.1	**”Function JC (joint coordinates)”:** This must be signalled back to the RC as a response to the RC output signal (item no 84) ”Operating mode MK has been selected” if JC is to be activated. If the signal is ”0”, no selection is performed. In case of external coordinate system selection, this signal determines the coordinate system for all kinematics.
73	A 9.1	A 9.1	A 8.1		8.2	**”Function WC (world coordinates)”:** This must be signalled back to the RC as a response to the RC output signal (item no 85) ”Operating mode RK has been selected” if WC is to be activated. If the signal is ”0”, no selection is performed. In case of external coordinate system selection, this signal determines the coordinate system for all kinematics.
74	A 9.2	A 9.2	A 8.2		8.3	**”Function GC (gripper coordinates)”:** This must be signalled back to the RC as a response to the RC output signal (item no 86) ”Operating mode GK has been selected” if GC is to be activated. If the signal is ”0”, no selection is performed. In case of external coordinate system selection, this signal determines the coordinate system for all kinematics.
75	A 9.3	A 9.3	A 8.3		8.4	Currently not used

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
76	A 9.4	A 9.4	A 8.4		8.5	**”Manual feed, slow”:**
77	A 9.5	A 9.5	A 8.5		8.6	**”Manual feed, fast”:**
78	A 9.6	A 9.6	A 8.6		8.7	**”Incrementel dimension, small”:**
79	A 9.7	A 9.7	A 8.7		8.8	**”Incremental dimension, large”:** If the signal ”External speed selection for Manual” = ”1” (RC input item no. 71), these RC inputs (item no. 76–79) can be wired freely via external signals. If the signal ”External speed selection for Manual” = ”0” (RC input item no. 71), the RC output ”Incremental JOG dimension, small” changes to ”1” if Manual is selected on the PHG. This signal must be signalled back as RC input ”Incremental dimension, small” (item no. 78) or as ”Incremental dimension, large” (item no. 77). If the system has traversed to this step, RC output (item no. 122) ”Continuous JOG slow” is set to ”1”. This signal must be signalled back as RC input ”Manual feed, slow” (item no. 76) or as ”Manual feed, fast” (item no. 77). The system traverses at this speed for a fixed period. The RC then issues the signal ”Continuous JOG, fast” (RC output item number 123). This signal must be signalled back as RC input ”Manual feed, slow” (RC input item no. 76) or as ”Manual feed, fast” (RC input item no. 77).

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
80	A 10.0	A 10.0	A 9.0	TO02F	9.1	**”Strobe, external process abort”:** When this signal changes fro ”0” to ”1”, the process selected via the data channel ”External program selection” and EXPROG.DAT is aborted. Correct abort is acknowledged by the control with the strobe signal (RC output item no. 116). If abort could not be performed, this is signalled by control with the strobe signal (RC output item no. 117).
81	A 10.1	A 10.1	A 9.1	TO02F	9.2	Currently not used
82	A 10.2	A 10.2	A 9.2		9.3	**”Acknowledgement for start-up signal”:** The output, item no. 66 ”Control new-start”, set by the RC, is acknowledged with this signal = ”1”. After this, the RC sets RC output (item no. 66) to ”0”. No further RC-internal functions are triggered.
83	A 10.3	A 10.3	A 9.3	TO02F	9.4	**”Parity, external program selection/abort”:** This must be set dependent on the parity set with machine parameter P4. If the parity is incorrect, the error signal RC output 111 is set in case of external program selection. The error signal RC output 117 is set in case of external process abort.
84	A 10.4	A 10.4	A 9.4		9.5	**”Strobe, external program selection”:** This initializes a program selected with the interface signals RC inputs (item no. 88–95) and the file EXPROG.DAT. Correct selection is acknowledged by the control with the strobe signal (RC output item no. 110). Program start is then triggered with ”Program start” (RC input item no. 21):
85	A 10.5	A 10.5	A 9.5		9.6	**”Strobe, coded text output”:** Coded text output is activated when ”0” changes to ”1”. The signal must be signalled to the RC as a Strobe signal with a minimum time of 100ms. In the event of an error, for example, the text for the selected number is not found, the RC output item no. 109, ”Error with coded text output” is set as a Strobe signal (strobe time can be set with machine parameter P2). If selection is correct, the RC output item no. 108, ”Acknowledgement coded text output”, is set as strobe signal.
86	A 10.6	A 10.6	A 9.6		9.7	**”Acceptance VFACTOR from interface”:** For as long as the signal is signalled as ”1” to the RC, the signal states (RC inputs item no. 986–103) (VFACTOR/AFACTOR/DFACTOR from the interface) are accepted by the RC as globally (that is, for all kinematics) active VFACTOR.
87	A 10.7	A 10.7	A 9.7		9.8	**”Acceptance AFACTOR/DFACTOR from interface”:** For as long as the signal is signalled as ”1” to the RC, the signal states (RC inputs item no. 96–103) (VFACTOR/AFACTOR/DFACTOR from the interface) are accepted by the RC as globally (that is, for all kinematics) active AFACTOR and DFACTOR.

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
88 95	A 11.0 . . . . A 11.7	A 11.0 . . . . A 11.7	A 10.0 . . . . A 10.7	TO02F	10.1 . . . . 10.8	**”External program selection/abort, bit 1–8 (bit significance 1–128)”:** Eight-bit-wide data channel for external selction or abort of programs/processes. The data are interpreted in the control as 2-digit hexadecimal numbers. On the basis of this hexadecimal number, a related program name is determined by means of a reference list (EXPROG.DAT), and this program, if found, is selected, or aborted. 256 different programs can be selected. In the event of an error: output error strobe (RC output item no. 111).
96 . . . 103	A 12.0 . . . A 12.7	A 12.0 . . . A 12.7	A 11.0 . . . A 11.7		11.1 . . . 11.8	**”VFACTOR/AFACTOR/DFACTOR from interface, bit 1–8 (bit significance 1–128)”:** The signals are interpreted by the RC as an 8-bit value and used as global VFACTOR or AFACTOR and DFACTOR.
104 . . . 111	A 13.0 . . . A 13.7	A 13.0 . . . A 13.7	A 12.0 . . . A 12.7		12.1 . . . 12.8	**”Coded text output, bit 1–8 (bit significance 1–128)”:** The signals are transferred to the RC with the strobe signal (RC input item no. 85) as decimal-coded text numbers (hexadecimal). The related text is stored in the reference file TEXTE.DAT.
112	A 14.0	A 14.0	A 13.0	TO02F	13.1	**”Disable: Coupling to the PG”** Disables the coupling function on the interface which is active for coupling to the PG. This interface is then free for read/write operations from BAPS programs.
113	A 14.1	A 14.1	A 13.1	TO02F	13.2	**”Disable: printer”:**
114	A 14.2	A 14.2	A 13.2	TO02F	13.3	**”Disable: serial interface 1”:**
115	A 14.3	A 14.3	A 13.3	TO02F	13.4	**”Disable: serial interface 2”:**
116	A 14.4	A 14.4	A 13.4	TO02F	13.5	**”Disable: serial interface 3”:**
117	A 14.5	A 14.5	A 13.5	TO02F	13.6	**”Disable: serial interface 4”:**
118	A 14.6	A 14.6	A 13.6		13.7	Currently not used
119	A 14.7	A 14.7	A 13.7	TO05D	13.8	**”Disable: Control reset with PHG”:** Disables the function ”Control reset with PHG (mode 11.1)

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
120 . . . 135	A 15.0 . . . A 16.7	A 15.0 . . . A 16.7	A 14.0 . . . A 15.7		14.1 . . . 15.8	**”Reference point 1st–16th axis”:** The signals indicate to the servo loop logic that the reference point switches have been reached. The meaning of the signal level or edge is defined with machine parameters P402 and P403.
136 . . . 139	A 17.0 . . . A 17.3	A 17.0 . . . A 17.3			16.1 . . . 16.4	**”Reference point 17th–20th axis”:** The signals indicate to the servo loop logic that the reference point switches have been reached. The meaning of the signal level or edge is defined with machine parameters P402 and P403.
140	A 17.4	A 17.4			16.5	Currently not used
141	A 17.5	A 17.5			16.6	Currently not used
142	A 17.6	A 17.6			16.7	Currently not used
143	A 17.7	A 17.7			16.8	Currently not used
144 . . . 163	A 18.0 . . . A 20.3	A 18.0 . . . A 20.3			17.1 . . . 19.4	Currently not used
164	A 20.4	A 20.4			19.5	Currently not used
165	A 20.5	A 20.5			19.6	Currently not used
166	A 20.6	A 20.6			19.7	Currently not used
167	A 20.7	A 20.7			19.8	Currently not used

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
168 175	A 21.0 . . . . A 21.7	A 21.0 . . . . . A 21.7	A 16.0 . . . . . A 16.7		20.1 . . . . . 20.8	**”Traverse enable 1st–8th kinematic”:** If the signal is ”1”, the block processing logic of the control for the i-th kinematic receives the enable signal for executing traversing blocks. See also the signal description of RC input 64. The individual signals only work if the group (RC input item no. 64) signal is set to ”0”.
176 177	A 22.0 . . . . . A 22.1	A 22.0 . . . . . A 22.1			21.1 . . . . . 21.2	**”Traverse enable 9th–10th kinematic”:** If the signal is ”1”, the block processing logic of the control for the i-th kinematic receives the enable signal for executing traversing blocks. See also the signal description of RC input 64. The individual signals only work if the group (RC input item no. 64) signal is set to ”0”.
178 . 191	A 22.2 . A 23.7	A 22.2 . A 23.7			21.3 . 22.8	Currently not used
192 207	A 24.0 . . . . A 25.7	A 24.0 . . . . A 25.7	A 17.0 . . . . A 18.7		23.1 . . . . 24.8	**”Drive-on 1st–16th axis”:** If the signal is ”1”, the relevant axis is in the servo loop. If the signal is ”0”, the internal axis positions are slaved and no servo errors occur if the axes are moved externally. After activation of a ”Drive-on” signal, the system continues starting with the current axis position. Whenever axis are to be moved without Drive-on, the error message ”Drive-on, no enable” is displayed. Additional information is provided in the manual ”*rho3 Options* ”. The individual signals only work if the group (RC input item no. 66) signal is set to ”0”.
208 211	A 26.0 . . . . A 26.3	A 26.0 . . . . A 26.3			25.1 . . . . 25.4	**”Drive-on 17th–20th axis”:** If the signal is ”1”, the relevant axis is in the servo loop. If the signal is ”0”, the internal axis positions are slaved and no servo errors occur if the axes are moved externally. After activation of a ”Drive-on” signal, the system continues starting with the current axis position. Whenever axis are to be moved without Drive-on, the error message ”Drive-on, no enable” is displayed. Additional information is provided in the manual ”*rho3 Options* ”. The individual signals only work if the group (RC input item no. 66) signal is set to ”0”.
212	A 26.4	A 26.4			25.5	Currently not used
213	A 26.5	A 26.5			25.6	Currently not used
214	A 26.6	A 26.6			25.7	Currently not used
215	A 26.7	A 26.7			25.8	Currently not used

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
216 . 231	A 27.0 . A 28.7	A 27.0 . A 28.7	A 19.0 . A 20.7	TO05E	26.1 . 27.8	**”Axis shutdown 1st axis – 16th axis”:** The ”1” signal can be used to shutdown an axis meaning that error monitoring (for example, measuring system monitoring), is no longer performed for the axis in question. When this is the case, a kinematik can continue to be used even though an axis is defective. An axis which has been shut down may no longer be used by means of a program, or in manual mode. Any such use leads to an error message. Shutdown status remains active until control run-up is performed with the reset signal (status ”0”).
232 . . 235	A 29.0 . . A 29.3	A 29.0 . . A 29.3		TO05E	28.1 . . 28.4	**”Axis shutdown 17th axis – 20th axis”:** (See description above)
236	A 29.4	A 29.4			28.5	Currently not used
237	A 29.5	A 29.5			28.6	Currently not used
238	A 29.6	A 29.6			28.7	Currently not used
239	A 29.7	A 29.7			28.8	Currently not used
240 . 247	A30.0 . A30.7	A30.0 . A30.7	A21.0 . A21.7		29.1 . 29.8	**”Feed enable 1st–8th kinematic”:** When this signal is ”1”, the axis movements of the respective kinematics are enabled, and when ”0” they are disabled.
248 . 249	A31.0 . A31.1	A31.0 . A31.1			30.1 . 30.2	**”Feed enable 9th–10th kinematic”:** When this signal is ”1”, the axis movements of the respective kinematics are enabled, and when ”0” they are disabled.
250 . 259	A31.2 . A32.3	A31.2 . A32.3			30.3 . 31.4	Currently not used
260	A32.4	A32.4			31.5	Currently not used
261	A32.5	A32.5			31.6	Currently not used
262	A32.6	A32.6			31.7	Currently not used
263	A32.7	A32.7			31.8	Currently not used
264 . 283	A33.0 . A35.3	A32.0 . A35.3		TO02F	32.1 . 34.4	Currently not used
284	A35.4	A35.4			34.5	Currently not used
285	A35.5	A35.5			34.6	Currently not used
286	A35.6	A35.6			34.7	Currently not used
287	A35.7	A35.7			34.8	Currently not used

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
288 . . . 303	A36.0 . . . A37.7	A36.0 . . . A37.7	A22.0 . . . A23.7		35.1 . . . 36.8	**”Jog 1st–16th axis (+)”:** When the operating modes ”Referencing” or ”Manual” is active, these signals trigger an axis movement in the positive direction. The signals are active at ”1”.
304 . . 307	A38.0 . . A38.3	A38.0 . . A38.3			37.1 . . 37.4	**”Jog 17th–20th axis (+)”:** When the operating modes ”Referencing” or ”Manual” is active, these signals trigger an axis movement in the positive direction. The signals are active at ”1”.
308	A38.4	A38.4			37.5	Currently not used
309	A38.5	A38.5			37.6	Currently not used
310	A38.6	A38.6			37.7	Currently not used
311	A38.7	A38.7			37.8	Currently not used
312 . . . 327	A39.0 . . . A40.7	A39.0 . . . A40.7	A24.0 . . . A25.7		38.1 . . . 39.8	**”Jog 1st–16th axis (–)”:** When the operating modes ”Referencing” or ”Manual” is active, these signals trigger an axis movement in the negative direction. The signals are active at ”1”.
328 . . . 331	A41.0 . . . A41.3	A41.0 . . . A41.3			40.1 . . . 40.4	**”Jog 17th–20th axis (–)”:** When the operating modes ”Referencing” or ”Manual” is active, these signals trigger an axis movement in the negative direction. The signals are active at ”1”.
332	A41.4	A41.4			40.5	Currently not used
333	A41.5	A41.5			40.6	Currently not used
334	A41.6	A41.6			40.7	Currently not used
335	A41.7	A41.7			40.8	Currently not used
336	A42.0	A42.0			41.1	Currently not used
337	A42.1	A42.1			41.2	Currently not used
338	A42.2	A42.2			41.3	Currently not used
339	A42.3	A42.3			41.4	Currently not used
340	A42.4	A42.4			41.5	Currently not used
341	A42.5	A42.5			41.6	Currently not used
342	A42.6	A42.6			41.7	Currently not used
343	A42.7	A42.7			41.8	Currently not used

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
344 . . . 359	A 43.0 . . . A 44.7	A 43.0 . . . A 44.7			42.1 . . . 43.8	Currently not used
360 . . 375	A 45.0 . . A 46.7	A 45.0 . . A 46.7			44.1 . . 45.8	Currently not used
376 . . . 383	A 47.0 . . . A 47.7	A 47.0 . . . A 47.7	A 26.0 . . A 26.7	TO02F	46.1 . . 46.8	**”Set belt counter 1–8”:** If the signal is ”1”, sets the corresponding belt counter to the value programmed with special function 28. (default value is ”0”)
384 . . 391	A 48.0 . . A 48.7	A 48.0 . . A 48.7			47.1 . . 47.8	Currently not used
392	A 49.0	A 49.0	A 27.0		48.1	**”Parity, integer input: 401”:** This bit must be set to ”0” or ”1” depending on the parity selected in machine parameter P4. In case of a malfunction, the user program is aborted with runtime error 26.
393	A 49.1	A 49.1	A 27.1		48.2	**”Parity, integer input: 402”:** This bit must be set to ”0” or ”1” depending on the parity selected in machine parameter P4. In case of a malfunction, the user program is aborted with runtime error 26.
394	A 49.2	A 49.2	A 27.2		48.3	**”Parity, integer input: 403”:** This bit must be set to ”0” or ”1” depending on the parity selected in machine parameter P4. In case of a malfunction, the user program is aborted with runtime error 26.
395	A 49.3	A 49.3	A 27.3		48.4	**”Parity, integer input: 404”:** This bit must be set to ”0” or ”1” depending on the parity selected in machine parameter P4. In case of a malfunction, the user program is aborted with runtime error 26.
396	A 49.4	A 49.4	A 27.4		48.5	**”Parity, integer input: 401+402”:** (In preparation) This bit must be set to ”0” or ”1” depending on the parity selected in machine parameter P4. In case of a malfunction, the selected program is aborted with runtime error 26.
397	A 49.5	A 49.5	A 27.5		48.6	**”Parity, integer input: 403+404”:** (In preparation) This bit must be set to ”0” or ”1” depending on the parity selected in machine parameter P4. In case of a malfunction, the selected program is aborted with runtime error 26.
398	A 49.6	A 49.6	A 27.6		48.7	**”Parity, integer output 401+402+403+404”:** (In preparation) This bit must be set to ”0” or ”1” depending on the parity selected in machine parameter P4. In case of a malfunction, the selected program is aborted with runtime error 26.

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
399	A 49.7	A 49.7	A 27.7	TO02F	48.8	**”Switch on belt simulation”:** If the signal is ”1”, the actual belt speeds are not considered; rather, the default values in machine parameter P508 are evaluated, meaning that all belt speeds are simulated.
400	A 50.0	A 50.0	A 28.0		49.1	**”Strobe, integer input 401”:** With strobe signal ”1”, the data at the byte input (RC input 408–415) are transferred to the RC inputs. The signal should be pending for at least 100ms. Transfer is possible without strobe signal by using the appropriate machine parameter option.
401	A 50.1	A 50.1	A 28.1		49.2	**”Strobe, integer input 402”:** With strobe signal ”1”, the data at the byte input (RC input 416–423) are transferred to the RC inputs. The signal should be pending for at least 100ms. Transfer is possible without strobe signal by using the appropriate machine parameter option.
402	A 50.2	A 50.2	A 28.2		49.3	**”Strobe, integer input 403”:** With strobe signal ”1”, the data at the byte input (RC input 424–431) are transferred to the RC inputs. The signal should be pending for at least 100ms. Transfer is possible without strobe signal by using the appropriate machine parameter option.
403	A 50.3	A 50.3	A 28.3		49.4	**”Strobe, integer input 404”:** With strobe signal ”1”, the data at the byte input (RC input 432–439) are transferred to the RC inputs. The signal should be pending for at least 100ms. Transfer is possible without strobe signal by using the appropriate machine parameter option.
404	A 50.4	A 50.4	A 28.4		49.5	Currently not used
405	A 50.5	A 50.5	A 28.5		49.6	Currently not used
406	A 50.6	A 50.6	A 28.6		49.7	Currently not used
407	A 50.7	A 50.7	A 28.7		49.8	Currently not used

RC inputs

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
408 415	A 51.0 . . . . A 51.7	A 51.0 . . . . A 51.7	A 29.0 . . . . A 29.7		50.1 . . . . 50.8	**”Integer input: 401, bit 0–7, bit significance 1 – 128”:** Integer input channel of BAPS. The values are accepted with the strobe signal RC input 400. Transfer is possible without strobe signal by using the appropriate machine parameter option. If synchronization with the BAPS program is intended, this must be implemented by means of the user I/O in conjunction with the program.
416 423	A 52.0 . . . . A 52.7	A 52.0 . . . . A 52.7	A 30.0 . . . . A 30.7		51.1 . . . . 51.8	**”Integer input: 402, bit 0–7, bit significance 1 – 128”:** Integer input channel of BAPS. The values are accepted with the strobe signal RC input 401. Transfer is possible without strobe signal by using the appropriate machine parameter option. If synchronization with the BAPS program is intended, this must be implemented by means of the user I/O in conjunction with the program.
424 431	A 53.0 . . . . A 53.7	A 53.0 . . . . A 53.7	A 31.0 . . . . A 31.7		52.1 . . . . 52.8	**”Integer input: 403, bit 0–7, bit significance 1 – 128”:** Integer input channel of BAPS. The values are accepted with the strobe signal RC input 402. Transfer is possible without strobe signal by using the appropriate machine parameter option. If synchronization with the BAPS program is intended, this must be implemented by means of the user I/O in conjunction with the program.
432 439	A 54.0 . . . . A 54.7	A 54.0 . . . . A 54.7	A 32.0 . . . . A 32.7		53.1 . . . . 53.8	**”Integer input: 404, bit 0–7, bit significance 1 – 128”:** Integer input channel of BAPS. The values are accepted with the strobe signal RC input 403. Transfer is possible without strobe signal by using the appropriate machine parameter option. If synchronization with the BAPS program is intended, this must be implemented by means of the user I/O in conjunction with the program.
440 . 463	A 55.0 . A 57.7	A 55.0 . A 57.7			54.1 . 56.8	Currently not used
464 . . . 559	A 58.0 . . . A 69.7	A 58.0 . . . A 69.7	A 33.0 . . . A 44.7		57.1 . . . 68.8	**”User input 1–96”:** These interface signals can be scanned by BAPS. They are evaluated in parallel as machine states 1–96.
560 . . . 583	A 70.0 . . . A 72.7	A 70.0 . . . A 72.7			69.1 . . . 71.8	**”User input 97–120”:** These interface signals can be scanned by BAPS. Binary user input: 97–99 are evaluated in parallel as machine states 97–99.
584 . 607	A 73.0 . A 75.7	A 73.0 . A 75.7			72.1 . 74.8	Currently not used

6.3 Outputs to the panel (panel signal outputs)

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
656 . . 679	A82.0 . . A84.7	A82.0 . . A84.7				Currently not used

6.4 Outputs to the MTB (MTB outputs)

Item no.	PIC addr.	PC600 addr.	CL300 addr.	appl.as of vers.	Byte. bit	Signal description
680 . . 703	A85.0 . . A87.7	A85.0 . . A87.7				Currently not used

6.5 Digital outputs of the I/O card, assignment standard PIC program

Item no.	PIC addr.	appl.as of vers.	Byte. bit	Signal description
704	A88.0		1.1	**”Cycle running”:** Indicates whether a process is currently active. It changes to ”0” when an activated process has reached the end of the program or no further processes are active.
705	A88.1		1.2	**”INPOS all axes”:** Group signal; if ”1”, indicates that all axes are in the in-position range.
706	A88.2		1.3	**”Feed hold, not”:** Indicates the state of the RC input A11.5.
707	A88.3		1.4	**”Programme selection OK”:** Acknowledgement signal for correct program selection by PHG or external. It is output as strobe signal. The time can be set with machine parameter P9 (system strobe time).
708	A88.4		1.5	**”Error during program selection”:** Signals an error during program selection; for instance, file not found. It is output as strobe signal. The time can be set with machine parameter P9 (system strobe time).
709	A88.5		1.6	**”Group alarm”:** Remains ”1” for as long as an error is pending in the RC.
710	A88.6		1.7	**”Reference points must be approached!”:** Is ”1” until all axes have approached their reference point once.
711	A88.7		1.8	**”Automatic/Manual, not”:** Indicates the active main operating mode. It is ”1” is the operating mode is Automatic; otherwise ”0”.
712 . . . 719	A89.0 . . . A89.7		2.1 . . . 2.8	**”Process output 1–8”:** Freely usable outputs for controlling machine functions. (Process output 1 in the standard PIC program indicates the state of the RC output item no. 113, ”HOLD command was recognized”.
720 . . . 743	A90.0 . . . A92.7		3.1 . . . 5.8	**”User output 1–24”:** Interface signal which can be set and reset by BAPS. Direct copy of the RC-internal user outputs.

7 Addressing the I/O card on PIC250

7.1 Digital outputs, first I/O card

Bit no.	PIC addr.	Interface BYTE.BIT	Appl. as of	Pin assignment	Cable X11 Order no. 048034
704	A 88.0	1.1		– > – X11.27	gray – green
705	A 88.1	1.2		– > – X11.50	brown – green – black
706	A 88.2	1.3		– > – X11.09	black
707	A 88.3	1.4		– > – X11.33	green – red
708	A 88.4	1.5		– > – X11.26	grayn – black
709	A 88.5	1.6		– > – X11.17	white – gray
710	A 88.6	1.7		– > – X11.08	red
711	A 88.7	1.8		– > – X11.49	white – green – black
712	A 89.0	2.1		– > – X11.25	white – black
713	A 89.1	2.2		– > – X11.16	yellow – brown
714	A 89.2	2.3		– > – X11.07	blue
715	A 89.3	2.4		– > – X11.32	yellow – blue
716	A 89.4	2.5		– > – X11.23	white – red
717	A 89.5	2.6		– > – X11.15	white – yellow
718	A 89.6	2.7		– > – X11.06	pink
719	A 89.7	2.8		– > – X11.48	red – blue –black
720	A 90.0	3.1		– > – X11.22	brown – blue
721	A 90.1	3.2		– > – X11.14	brown – green
722	A 90.2	3.3		– > – X11.05	gray
723	A 90.3	3.4		– > – X11.31	green – blue
724	A 90.4	3.5		– > – X11.21	white – blue
725	A 90.5	3.6		– > – X11.13	white – green
726	A 90.6	3.7		– > – X11.04	yellow
727	A 90.7	3.8		– > – X11.30	yellow – pink
728	A 91.0	4.1		– > – X11.20	pink – brown
729	A 91.1	4.2		– > – X11.12	red – blue
730	A 91.2	4.3		– > – X11.03	green
731	A 91.3	4.4		– > – X11.29	pink – green
732	A 91.4	4.5		– > – X11.36	yellow – black
733	A 91.5	4.6		– > – X11.11	gray – pink
734	A 91.6	4.7		– > – X11.02	brown
735	A 91.7	4.8		– > – X11.28	yellow – gray
736	A 92.0	5.1		– > – X11.19	white – pink
737	A 92.1	5.2		– > – X11.10	violet
738	A 92.2	5.3		– > – X11.01	white
739	A 92.3	5.4		– > – X11.47	gray – pink – black
740	A 92.4	5.5		– > – X11.18	gray – brown
741	A 92.5	5.6		– > – X11.34	yellow – red
742	A 92.6	5.7		– > – X11.35	green – black
743	A 92.7	5.8		– > – X11.37	gray – blue
				X11. 37 – 46	not used

7.2 Digital inputs, first I/O card

Bit no.	PIC addr.	Interface BYTE.BIT	Appl. as of	Pin assignment	Cable X22 Order no. 048032
704	E88.0	1.1		– < – X22.48	red – blue –black
705	E88.1	1.2		– < – X22.47	gray – pink –black
706	E88.2	1.3		– < – X22.50	brown – green – black
707	E88.3	1.4		– < – X22.49	white – green – black
708	E88.4	1.5		– < – X22.33	green – red
709	E88.5	1.6		– < – X22.32	yellow – blue
710	E88.6	1.7		– < – X22.17	white – gray
711	E88.7	1.8		– < – X22.16	yellow – brown
712	E89.0	2.1		– < – X22.46	yellow – green – black
713	E89.1	2.2		– < – X22.15	white – yellow
714	E89.2	2.3		– < – X22.31	green – blue
715	E89.3	2.4		– < – X22.45	white – brown – black
716	E89.4	2.5		– < – X22.30	yellow – pink
717	E89.5	2.6		– < – X22.14	brown – green
718	E89.6	2.7		– < – X22.29	pink – green
719	E89.7	2.8		– < – X22.44	red – black
720	E90.0	3.1		– < – X22.13	white – green
721	E90.1	3.2		– < – X22.12	red – blue
722	E90.2	3.3		– < – X22.28	yellow – gray
723	E90.3	3.4		– < – X22.43	blue – black
724	E90.4	3.5		– < – X22.11	gray – pink
725	E90.5	3.6		– < – X22.27	gray – green
726	E90.6	3.7		– < – X22.42	pink – black
727	E90.7	3.8		– < – X22.10	violet
728	E91.0	4.1		– < – X22.26	brown – black
729	E91.1	4.2		– < – X22.41	gray – black
730	E91.2	4.3		– < – X22.09	black
731	E91.3	4.4		– < – X22.25	white – black
732	E91.4	4.5		– < – X22.24	brown – red
733	E91.5	4.6		– < – X22.08	red
734	E91.6	4.7		– < – X22.40	pink – red
735	E91.7	4.8		– < – X22.07	blue

Digital inputs, first I/O card

Bit no.	PIC addr.	Interface BYTE.BIT	Appl. as of	Pin assignment	Cable X22 Order no. 048032
736	E92.0	5.1		– < – X22.23	white – red
737	E92.1	5.2		– < – X22.39	gray – red
738	E92.2	5.3		– < – X22.06	pink
739	E92.3	5.4		– < – X22.22	brown – blue
740	E92.4	5.5		– < – X22.38	pink – blue
741	E92.5	5.6		– < – X22.05	gray
742	E92.6	5.7		– < – X22.21	white – blue
743	E92.7	5.8		– < – X22.04	yellow
744	E93.0	6.1		– < – X22.37	gray – blue
745	E93.1	6.2		– < – X22.20	pink – brown
746	E93.2	6.3		– < – X22.03	green
747	E93.3	6.4		– < – X22.36	yellow – black
748	E93.4	6.5		– < – X22.19	white – pink
749	E93.5	6.6		– < – X22.02	brown
750	E93.6	6.7		– < – X22.01	white
751	E93.7	6.8		– < – X22.18	gray – brown
752	E94.0	7.1		– < – X22.34	yellow – red
753	E94.1	7.2		– < – X22.35	green – black
Bit no.	**PIC addr.**	**Interface BYTE.BIT**	**Appl. as of**	**Pin assignment**	**Cable X22 Order no. 048032**
754	E94.2	7.3		– < – X21.15	white – yellow
755	E94.3	7.4		– < – X21.07	blue
756	E94.4	7.5		– < – X21.14	brown – green
757	E94.5	7.6		– < – X21.06	pink
758	E94.6	7.7		– < – X21.13	white – green
769	E95.7	7.8		– < – X21.05	gray
760	E95.0	8.1		– < – X21.12	red – blue
761	E95.1	8.2		– < – X21.04	yellow
762	E95.2	8.3		– < – X21.11	gray – pink
763	E95.3	8.4		– < – X21.03	green
764	E95.4	8.5		– < – X21.10	violet
765	E95.5	8.6		– < – X21.02	brown
766	E95.6	8.7		– < – X21.09	black
767	E95.7	8.8		– < – X21.01	white
				– < – X21.08	red (not used)

7.3 Digital outputs, second I/O card

Bit no.	PIC addr.	Interface BYTE.BIT	Appl. as of	Pin assignment	Cable X11 Order no. 048034
744	A 93.0	6.1		– > – X11.27	gray – green
745	A 93.1	6.2		– > – X11.50	brown – green – black
746	A 93.2	6.3		– > – X11.09	black
747	A 93.3	6.4		– > – X11.33	green – red
748	A 93.4	6.5		– > – X11.26	grayn – black
749	A 93.5	6.6		– > – X11.17	white – gray
750	A 93.6	6.7		– > – X11.08	red
751	A 93.7	6.8		– > – X11.49	white – green – black
752	A 94.0	7.1		– > – X11.25	white – black
753	A 94.1	7.2		– > – X11.16	yellow – brown
754	A 94.2	7.3		– > – X11.07	blue
755	A 94.3	7.4		– > – X11.32	yellow – blue
756	A 94.4	7.5		– > – X11.23	white – red
757	A 94.5	7.6		– > – X11.15	white – yellow
758	A 94.6	7.7		– > – X11.06	pink
759	A 94.7	7.8		– > – X11.48	red – blue –black
760	A 95.0	8.1		– > – X11.22	brown – blue
761	A 95.1	8.2		– > – X11.14	brown – green
762	A 95.2	8.3		– > – X11.05	gray
763	A 95.3	8.4		– > – X11.31	green – blue
764	A 95.4	8.5		– > – X11.21	white – blue
765	A 95.5	8.6		– > – X11.13	white – green
766	A 95.6	8.7		– > – X11.04	yellow
767	A 95.7	8.8		– > – X11.30	yellow – pink
768	A 96.0	9.1		– > – X11.20	pink – brown
769	A 96.1	9.2		– > – X11.12	red – blue
770	A 96.2	9.3		– > – X11.03	green
771	A 96.3	9.4		– > – X11.29	pink – green
772	A 96.4	9.5		– > – X11.36	yellow – black
773	A 96.5	9.6		– > – X11.11	gray – pink
774	A 96.6	9.7		– > – X11.02	brown
775	A 96.7	9.8		– > – X11.28	yellow – gray
776	A 97.0	10.1		– > – X11.19	white – pink
777	A 97.1	10.2		– > – X11.10	violet
778	A 97.2	10.3		– > – X11.01	white
779	A 97.3	10.4		– > – X11.47	gray – pink – black
780	A 97.4	10.5		– > – X11.18	gray – brown
781	A 97.5	10.6		– > – X11.34	yellow – red
782	A 97.6	10.7		– > – X11.35	green – black
783	A 97.7	10.8		– > – X11.37	gray – blue
				X11. 37 – 46	not used

7.4 Digital inputs, second I/O card

Bit no.	PIC addr.	Interface BYTE.BIT	Appl. as of	Pin assignment	Cable X22 Order no. 048032
768	E96.0	9.1		– < – X22.48	red – blue –black
769	E96.1	9.2		– < – X22.47	gray – pink –black
770	E96.2	9.3		– < – X22.50	brown – green – black
771	E96.3	9.4		– < – X22.49	white – green – black
772	E96.4	9.5		– < – X22.33	green – red
773	E96.5	9.6		– < – X22.32	yellow – blue
774	E96.6	9.7		– < – X22.17	white – gray
775	E96.7	9.8		– < – X22.16	yellow – brown
776	E97.0	10.1		– < – X22.46	yellow – green – black
777	E97.1	10.2		– < – X22.15	white – yellow
778	E97.2	10.3		– < – X22.31	green – blue
779	E97.3	10.4		– < – X22.45	white – brown – black
780	E97.4	10.5		– < – X22.30	yellow – pink
781	E97.5	10.6		– < – X22.14	brown – green
782	E97.6	10.7		– < – X22.29	pink – green
783	E97.7	10.8		– < – X22.44	red – black
784	E98.0	11.1		– < – X22.13	white – green
785	E98.1	11.2		– < – X22.12	red – blue
786	E98.2	11.3		– < – X22.28	yellow – gray
787	E98.3	11.4		– < – X22.43	blue – black
788	E98.4	11.5		– < – X22.11	gray – pink
789	E98.5	11.6		– < – X22.27	gray – green
790	E98.6	11.7		– < – X22.42	pink – black
791	E98.7	11.8		– < – X22.10	violet
792	E99.0	12.1		– < – X22.26	brown – black
793	E99.1	12.2		– < – X22.41	gray – black
794	E99.2	12.3		– < – X22.09	black
795	E99.3	12.4		– < – X22.25	white – black
796	E99.4	12.5		– < – X22.24	brown – red
797	E99.5	12.6		– < – X22.08	red
798	E99.6	12.7		– < – X22.40	pink – red
799	E99.7	12.8		– < – X22.07	blue

Digital inputs, second I/O card

Bit no.	PIC addr.	Interface BYTE.BIT	Appl. as of	Pin assignment	Cable X22 Order no. 048032
800	E100.0	13.1		– < – X22.23	white – red
801	E100.1	13.2		– < – X22.39	gray – red
802	E100.2	13.3		– < – X22.06	pink
803	E100.3	13.4		– < – X22.22	brown – blue
804	E100.4	13.5		– < – X22.38	pink – blue
805	E100.5	13.6		– < – X22.05	gray
806	E100.6	13.7		– < – X22.21	white – blue
807	E100.7	13.8		– < – X22.04	yellow
808	E101.0	14.1		– < – X22.37	gray – blue
809	E101.1	14.2		– < – X22.20	pink – brown
810	E101.2	14.3		– < – X22.03	green
811	E101.3	14.4		– < – X22.36	yellow – black
812	E101.4	14.5		– < – X22.19	white – pink
813	E101.5	14.6		– < – X22.02	brown
814	E101.6	14.7		– < – X22.01	white
815	E101.7	14.8		– < – X22.18	gray – brown
816	E102.0	15.1		– < – X22.34	yellow – red
817	E102.1	15.2		– < – X22.35	green – black
Bit no.	**PIC addr.**	**Interface BYTE.BIT**	**Appl. as of**	**Pin assignment**	**Cable X21 Order no. 048033**
818	E102.2	15.3		– < – X21.15	white – yellow
819	E102.3	15.4		– < – X21.07	blue
820	E102.4	15.5		– < – X21.14	brown – green
821	E102.5	15.6		– < – X21.06	pink
822	E102.6	15.7		– < – X21.13	white – green
823	E102.7	15.8		– < – X21.05	gray
824	E103.0	16.1		– < – X21.12	red – blue
825	E103.1	16.2		– < – X21.04	yellow
826	E103.2	16.3		– < – X21.11	gray – pink
827	E103.3	16.4		– < – X21.03	green
828	E103.4	16.5		– < – X21.10	violet
829	E103.5	16.6		– < – X21.02	brown
830	E103.6	16.7		– < – X21.09	black
831	E103.7	16.8		– < – X21.01	white
				– < – X21.08	red (not used)

8 Marker assignment on PIC250

8.1 Markers for the counters

Bit no.	PIC addr.	Appl. as of	Signal description
0	M 0.0		Decrement, down–counter 0
1	M 0.1		Decrement, down–counter 1
2	M 0.2		Decrement, down–counter 2
3	M 0.3		Decrement, down–counter 3
4	M 0.4		Decrement, down–counter 4
5	M 0.5		Decrement, down–counter 5
6	M 0.6		Decrement, down–counter 6
7	M 0.7		Decrement, down–counter 7
8	M 1.0		Down–counter 0 is ready
9	M 1.1		Down–counter 1 is ready
10	M 1.2		Down–counter 2 is ready
11	M 1.3		Down–counter 3 is ready
12	M 1.4		Down–counter 4 is ready
13	M 1.5		Down–counter 5 is ready
14	M 1.6		Down–counter 6 is ready
15	M 1.7		Down–counter 7 is ready
40	M 5.0		Down–counter 0 reset
41	M 5.1		Down–counter 1 reset
42	M 5.2		Down–counter 2 reset
43	M 5.3		Down–counter 3 reset
44	M 5.4		Down–counter 4 reset
45	M 5.5		Down–counter 5 reset
46	M 5.6		Down–counter 6 reset
47	M 5.7		Down–counter 7 reset

Markers for the counters

Bit no.	PIC addr.	Appl. as of	Signal description
48	M 6.0	TO03F	Decrement, down–counter 8
49	M 6.1	TO03F	Decrement, down–counter 9
50	M 6.2	TO03F	Decrement, down–counter 10
51	M 6.3	TO03F	Decrement, down–counter 11
52	M 6.4	TO03F	Decrement, down–counter 12
53	M 6.5	TO03F	Decrement, down–counter 13
54	M 6.6	TO03F	Decrement, down–counter 14
55	M 6.7	TO03F	Decrement, down–counter 15
56	M 7.0	TO03F	Down–counter 8 is ready
57	M 7.1	TO03F	Down–counter 9 is ready
58	M 7.2	TO03F	Down–counter 10 is ready
59	M 7.3	TO03F	Down–counter 11 is ready
60	M 7.4	TO03F	Down–counter 12 is ready
61	M 7.5	TO03F	Down–counter 13 is ready
62	M 7.6	TO03F	Down–counter 14 is ready
63	M 7.7	TO03F	Down–counter 15 is ready
88	M 11.0	TO03F	Down–counter 8 reset
89	M 11.1	TO03F	Down–counter 9 reset
90	M 11.2	TO03F	Down–counter 10 reset
91	M 11.3	TO03F	Down–counter 11 reset
92	M 11.4	TO03F	Down–counter 12 reset
93	M 11.5	TO03F	Down–counter 13 reset
94	M 11.6	TO03F	Down–counter 14 reset
95	M 11.7	TO03F	Down–counter 15 reset

Markers for the counters

Bit no.	PIC addr.	Appl. as of	Signal description
96	M 12.0	TO03F	Decrement, down–counter 16
97	M 12.1	TO03F	Decrement, down–counter 17
98	M 12.2	TO03F	Decrement, down–counter 18
99	M 12.3	TO03F	Decrement, down–counter 19
100	M 12.4	TO03F	Decrement, down–counter 20
101	M 12.5	TO03F	Decrement, down–counter 21
102	M 12.6	TO03F	Decrement, down–counter 22
103	M 12.7	TO03F	Decrement, down–counter 23
104	M 13.0	TO03F	Down–counter 16 is ready
105	M 13.1	TO03F	Down–counter 17 is ready
106	M 13.2	TO03F	down–counter 18 is ready
107	M 13.3	TO03F	Down–counter 19 is ready
108	M 13.4	TO03F	Down–counter 20 is ready
109	M 13.5	TO03F	Down–counter 21 is ready
110	M 13.6	TO03F	Down–counter 22 is ready
111	M 13.7	TO03F	Down–counter 23 is ready
136	M 17.0	TO03F	Down–counter 16 reset
137	M 17.1	TO03F	Down–counter 17 reset
138	M 17.2	TO03F	Down–counter 18 reset
139	M 17.3	TO03F	Down–counter 19 reset
140	M 17.4	TO03F	Down–counter 20 reset
141	M 17.5	TO03F	Down–counter 21 reset
142	M 17.6	TO03F	Down–counter 22 reset
143	M 17.7	TO03F	Down–counter 23 reset

Markers for the counters

Bit no.	PIC addr.	Appl. as of	Signal description
144	M 18.0	TO03F	Decrement, down–counter 24
145	M 18.1	TO03F	Decrement, down–counter 25
146	M 18.2	TO03F	Decrement, down–counter 26
147	M 18.3	TO03F	Decrement, down–counter 27
148	M 18.4	TO03F	Decrement, down–counter 28
149	M 18.5	TO03F	Decrement, down–counter 29
150	M 18.6	TO03F	Decrement, down–counter 30
151	M 18.7	TO03F	Decrement, down–counter 31
152	M 19.0	TO03F	Down–counter 24 is ready
153	M 19.1	TO03F	Down–counter 25 is ready
154	M 19.2	TO03F	Down–counter 26 is ready
155	M 19.3	TO03F	Down–counter 27 is ready
156	M 19.4	TO03F	Down–counter 28 is ready
157	M 19.5	TO03F	Down–counter 28 is ready
158	M 19.6	TO03F	Down–counter 30 is ready
159	M 19.7	TO03F	Down–counter 31 is ready
184	M 23.0	TO03F	Down–counter 24 reset
185	M 23.1	TO03F	Down–counter 25 reset
186	M 23.2	TO03F	Down–counter 26 reset
187	M 23.3	TO03F	Down–counter 27 reset
188	M 23.4	TO03F	Down–counter 28 reset
189	M 23.5	TO03F	Down–counter 29 reset
190	M 23.6	TO03F	Down–counter 30 reset
191	M 23.7	TO03F	Down–counter 31 reset

8.2 Markers for the timers

Bit no.	PIC addr.	Appl. as of	Signal description
16	M 2.0		Start Timer 0
17	M 2.1		Start Timer 1
18	M 2.2		Start Timer 2
19	M 2.3		Start Timer 3
20	M 2.4		Start Timer 4
21	M 2.5		Start Timer 5
22	M 2.6		Start Timer 6
23	M 2.7		Start Timer 7
24	M 3.0		Timer 0 is ready
25	M 3.1		Timer 1 is ready
26	M 3.2		Timer 2 is ready
27	M 3.3		Timer 3 is ready
28	M 3.4		Timer 4 is ready
29	M 3.5		Timer 5 is ready
30	M 3.6		Timer 6 is ready
31	M 3.7		Timer 7 is ready
32	M 4.0		Timer 0 is active
33	M 4.1		Timer 1 is active
34	M 4.2		Timer 2 is active
35	M 4.3		Timer 3 is active
36	M 4.4		Timer 4 is active
37	M 4.5		Timer 5 is active
38	M 4.6		Timer 6 is active
39	M 4.7		Timer 7 is active

Markers for the timers

Bit no.	PIC addr.	Appl. as of	Signal description
64	M 8.0	TO03F	Start Timer 8
65	M 8.1	TO03F	Start Timer 9
66	M 8.2	TO03F	Start Timer 10
67	M 8.3	TO03F	Start Timer 11
68	M 8.4	TO03F	Start Timer 12
69	M 8.5	TO03F	Start Timer 13
70	M 8.6	TO03F	Start Timer 14
71	M 8.7	TO03F	Start Timer 15
72	M 9.0	TO03F	Timer 8 is ready
73	M 9.1	TO03F	Timer 9 is ready
74	M 9.2	TO03F	Timer 10 is ready
75	M 9.3	TO03F	Timer 11 is ready
76	M 9.4	TO03F	Timer 12 is ready
77	M 9.5	TO03F	Timer 13 is ready
78	M 9.6	TO03F	Timer 14 is ready
79	M 9.7	TO03F	Timer 15 is ready
80	M 10.0	TO03F	Timer 8 is active
81	M 10.1	TO03F	Timer 9 is active
82	M 10.2	TO03F	Timer 10 is active
83	M 10.3	TO03F	Timer 11 is active
84	M 10.4	TO03F	Timer 12 is active
85	M 10.5	TO03F	Timer 13 is active
86	M 10.6	TO03F	Timer 14 is active
87	M 10.7	TO03F	Timer 15 is active

Markers for the timers

Bit no.	PIC addr.	Appl. as of	Signal description
112	M 14.0	TO03F	Start Timer 16
113	M 14.1	TO03F	Start Timer 17
114	M 14.2	TO03F	Start Timer 18
115	M 14.3	TO03F	Start Timer 19
116	M 14.4	TO03F	Start Timer 20
117	M 14.5	TO03F	Start Timer 21
118	M 14.6	TO03F	Start Timer 22
119	M 14.7	TO03F	Start Timer 23
120	M 15.0	TO03F	Timer 16 is ready
121	M 15.1	TO03F	Timer 17 is ready
122	M 15.2	TO03F	Timer 18 is ready
123	M 15.3	TO03F	Timer 19 is ready
124	M 15.4	TO03F	Timer 20 is ready
125	M 15.5	TO03F	Timer 21 is ready
126	M 15.6	TO03F	Timer 22 is ready
127	M 15.7	TO03F	Timer 23 is ready
128	M 16.0	TO03F	Timer 16 is active
129	M 16.1	TO03F	Timer 17 is active
130	M 16.2	TO03F	Timer 18 is active
131	M 16.3	TO03F	Timer 19 is active
132	M 16.4	TO03F	Timer 20 is active
133	M 16.5	TO03F	Timer 21 is active
134	M 16.6	TO03F	Timer 22 is active
135	M 16.7	TO03F	Timer 23 is active

Markers for the timers

Bit no.	PIC addr.	Appl. as of	Signal description
160	M 20.0	TO03F	Start Timer 24
161	M 20.1	TO03F	Start Timer 25
162	M 20.2	TO03F	Start Timer 26
163	M 20.3	TO03F	Start Timer 27
164	M 20.4	TO03F	Start Timer 28
165	M 20.5	TO03F	Start Timer 29
166	M 20.6	TO03F	Start Timer 30
167	M 20.7	TO03F	Start Timer 31
168	M 21.0	TO03F	Timer 24 is ready
169	M 21.1	TO03F	Timer 25 is ready
170	M 21.2	TO03F	Timer 26 is ready
171	M 21.3	TO03F	Timer 27 is ready
172	M 21.4	TO03F	Timer 28 is ready
173	M 21.5	TO03F	Timer 29 is ready
174	M 21.6	TO03F	Timer 30 is ready
175	M 21.7	TO03F	Timer 31 is ready
176	M 22.0	TO03F	Timer 24 is active
177	M 22.1	TO03F	Timer 25 is active
178	M 22.2	TO03F	Timer 26 is active
179	M 22.3	TO03F	Timer 27 is active
180	M 22.4	TO03F	Timer 28 is active
181	M 22.5	TO03F	Timer 29 is active
182	M 22.6	TO03F	Timer 30 is active
183	M 22.7	TO03F	Timer 31 is active

9 List of errors

List of coded errors output to the interface together with the texts displayed on the PHG under ”Diagnosis error”, possible error causes, and corrective measures..

9.1 Group 0 : Possible errors

1 = In automatic mode: Programmed kinematics is in Set-up

PHG display : ’inadmis.in manual op’
Cause : The kinematics in question is in the Set-up mode.
Correction : Switch to AUTOMATIC.
Occurs only when option ”AUTO/MANUAL per kinematic” is active.

---

2 = In test mode: Programmed kinematics is in automatic mode

PHG display : ’inadmis.in autom.op’
Cause : In the test mode, a kinematic which is in AUTOMATIC is intended for movement.
Correction : Switch to SET-UP.
Occurs only when option ”AUTO/MANUAL per kinematic” is active.

---

3 = Incorrect absolute address in the IRDATA program

PHG display : ’inco.abs.addr. in IRD’
Ursache : System-related error, safety monitoring
Correction : Please consult customer service.

---

4 = Illegal output

PHG display : ’inadmissable output’
Cause : The channel number of the programmed output is illegal.
Correction : Check QLL program.

---

5 = Illegal input

PHG display : ’inadmissable input’
Cause : The channel number of the programmed input is illegal.
Correction : Check QLL program.

---

6 = Illegal axis programmed for referencing

PHG display : ’inadmiss. axis progr’
Cause : Machine parameters incorrectly set.
Correction : Check machine parameter P402.

---

7 = Transformation error in the IRDATA program

PHG display : ’transf.err. IRD–prog’
Cause : In the QLL program, an JC point is to be transferred to a POINT, or vice-versa. Transfer is not possible.
Correction : Check QLL program.

Group 0 : Possible errors

8 = IRD or PKT file does not exist

PHG display : 'file not found'
Cause : File(s) not in memory, error during compilation.
Correction : List the current memory.

---

9 = Negative delay time programmed

PHG display : 'negative dwell'
Cause : BAPS variable incorrectly determined.
Correction : Check QLL program.

---

10 = Kinematics number of program and kinematics number of control do not agree

PHG display : 'incorrect KIN–number'
Cause : Incorrect compilation instruction in the QLL program or incorrect machine parameter.
Correction : Note compilation instruction in the QLL program.
Check machine parameter P1.

---

11 = Error in the IRDATA program

PHG display : 'error in IRD program'
Cause : Incorrect IRDATA code due to error in the compiler, safety monitoring.
Correction : Please consult customer service.

---

12 = IRDATA stack overflow (upper limit)

PHG display : 'IRD–Stack overflow'
Cause : For example: recursive subroutine call.
Correction : Check sub-program nesting in the QLL program.

---

13 = IRDATA stack overflow (lower limit)

PHG display : 'IRD–Stack ov. (low)'
Cause : System-related error, safety monitoring
Correction : Please consult customer service.

---

14 = Number of axis of program and number of axis of control do not agree

PHG display : 'incorrect axisnumber'
Cause : Incorrect compilation instruction in the QLL program or incorrect machine parameter.
Correction : Note compilation instruction in the QLL program.
Check machine parameters.

---

15 = Field limits exceeded

PHG display : 'array e.out of range'
Cause : Index calculation incorrect or indices not preselected.
Correction : Check QLL program.

Group 0 : Possible errors

16 = File name is too long or contains illegal characters

PHG display : 'IRD prog.na. too long'
Cause : File names or program name used in the QLL program are either too long or illegal.
Correction : Check QLL program.

---

17 = Option configuration not active

PHG display : 'IRD option n. active'
Cause : A prohibited BAPS function was used.
Correction : Check QLL program. Determine permitted configurations.

---

18 = No points file

PHG display : 'no such PKT file'
Cause : Points file not loaded or deleted.
Correction : List current memory.

---

19 = The point addressed in the program is not defined

PHG display : 'point not defined'
Cause : An undefined point is addressed.
Correction : Check points file; define/teach point.

---

20 = Belt synchronization cannot be activated

PHG display : 'Beltsync. n.possible'
Cause : Shift command or circular interpolation as next traverse block after belt synchronization.
Correction : Check QLL program.

---

21 = Illegal integer output value

PHG display : 'inad. output value'
Cause : Output value not within permissible range (0..255).
Correction : Check QLL program.

---

22 = Switchover right-handedness/left-handedness for LINEAR is illegal

PHG display : 'pt.n.reach.w.intpol.'
Cause : Point with the active "handedness" cannot be approached.
Correction : Check QLL program.

---

23 = PTP is illegal during belt synchronization

PHG display : 'PTP not allowed here'
Cause : PTP movement programmed during active belt synchronization.
Correction : Check QLL program.

---

24 = Division by zero in the user program

PHG display : 'division by zero'
Cause : For example, BAPS variable not preset.
Correction : Check QLL program.

Group 0 : Possible errors

25 = Square root with negative argument in the user program

PHG display : 'neg.argu. by sq.root'
Cause :
Correction : Check QLL program.

---

26 = Parity error while reading INTEGER inputs

PHG display : 'parity data input'
Cause : The parity of the addressed Integer input does not agree with the preset parity.
Correction : Check the interface program and/or machine program.

---

27 = Illegal parameter during call of an external sub-program

PHG display : 'inad.par. in SPC_FCT
Cause : In a BAPS–program an external program was called with a file variable, an array or an I/O–variable.
Correction : Check QLL program.

---

28 = Format error in DAT file

PHG display : 'format error in DAT'
Cause : The type of the variable to be read does not correspond to the format in the file.
Correction : Check QLL program and the DAT file.

---

29 = An illegal time (T <= 0) was programmed for "MOVE WITH T"

PHG display : 'travel time not all.'
Cause :
Correction : Check QLL program.

---

30 = Illegal speed programmed ((V/V_PTP <= 0 or V_PTP >1)

PHG display : 'velocity not all.'
Cause : Illegal value for "V" or "V_PTP" programmed.
Correction : Check QLL program.

---

31 = Interface error

PHG display : 'interface error'
Cause : Issued for various errors which occur in conjunction with device I/O's (such as No interface, Interface occupied, Timeout, Parity error, or Framing error):
Correction : Check interfaces, interface parameters/protocol, or cable.

---

32 = Protocol error while writing

PHG display : 'prot.err.whlie WRITE'
Cause : The value to be copied is larger than the permissible format.
Correction : Check QLL program. Refer to manual for permissible format.

Group 0 : Possible errors

33 = Protocol error while reading

PHG display : 'prot.err. while READ'
Cause : Read format does not correspond to the set format.
Correction : Check QLL program and format. Refer to manual.

---

34 = Interpolator stop during PPO or IOL function

PHG display : 'PPO/IOL:IPO–Stop'
Cause : Interpolator stop was recognized by control during an active PPO or IOL function.
Correction : The speed may be too high.

---

35 = Programmed PPO position was not reached

PHG display : 'PPO:POS not reached'
Cause : The position ofthe programmed PPO position was not reached.
Correction : Check whether the programmed position is on the belt.

---

36 = The switch-off position of the programmed IOL function was not reached

PHG display : 'IOL:Offpos.n.rea/prg'
Cause : When the programmed switch-on position of an IOL function was reached, it was determined that the signal to be activated has not been reset (deactivated).
Correction :

---

37 = Incorrect point file

PHG display : 'incorrect PKT file'
Cause : The point file and the IRD file do not agree.
Correction : It may be that only the IRD file was loaded during the reload and compile procedure; i.e., the point file and the IRD file have different dates (file identifier).

---

38 = Number not a decimal number. Overflow or insufficient

PHG display : 'inad.Real–Expression'
Cause : Number is not within permissible range (–10 to the 37th...10 to the –38th).
Correction :

---

39 = System memory in the controller is full

PHG display : 'HEAP overflow'
Cause : It may be that too many processes have been started.
Correction : Check memory in the machine parameters.

Group 0 : Possible errors

40 = User process error

PHG display : 'error in USER–TASK'
Cause :
Correction :

---

41 = User process already exists at selection

PHG display : 'proc. already exists'
Cause : An existing process is started a second time.
Correction : Check QLL program.

---

42 = Sub-process stops its own main process

PHG display : 'sub–pr. canc. main–p'
Cause : A main process started a sub-process (PARALLEL, ELSE, PARELLEL_ END). An attempt is made in the sub-process to stop the main process with STOP.
Correction : Check QLL program(s).

---

43 = PUBLIC file missing

PHG display : 'PUBLIC–file missing'
Cause : Public variables are used in the program. The required public file cannot be found.
Correction : Please reload public file.

---

44 = PUBLIC–COMMON–ID

PHG display : 'PUBLIC COMMON ID'
Cause : The PUBLIC file was compiled later than the importing file.
Correction : First compile the PUBLIC file, ***and then all*** importing files.

---

45 = Two PUBLIC files

PHG display : 'two PUBLIC–files'
Cause : Public variables from two public files are being used.
Correction : Export all public data to ***one file.***

---

46 = Currently not used

PHG display :
Cause :
Correction :

---

47 = File TOOL.DAT cannot be found

PHG display : 'TOOL.DAT missing'
Cause :
Correction : Check current memory contents.

Group 0 : Possible errors

48 = Tool name in TOOL.DAT not found

PHG display : 'Name of tool missing'
Cause :
Correction : Check TOOL.DAT.

---

49 = For file I/O, protected file was accessed

PHG display : 'file protected'
Cause :
Correction :

---

50 = Currently not used

PHG display :
Cause :
Correction :

---

51 = File sequentialization for IRD and PKT not possible

PHG display : 'file–sequ. failed'
Cause : Insufficient memory.
Correction : Delete superfluous files from memory, or remove "gaps" by resetting.

---

52 = PARALLEL instruction error

PHG display : 'parallel packing'
Cause : Nesting of the "PARALLEL" statement not allowed.
Correction : Check QLL program.

---

53 = IRDATA code does not agree with current IRDATA interpreter

PHG display : 'incorr. BAPS–version'
Cause : Current interpreter in the control and PG are different.
Correction : Recompile existing programs.

---

54 = User memory full

PHG display : 'user memory full'
Cause : Insufficient user memory.
Correction : Delete superfluous files from memory.

---

55 = The instruction WRITE_BEGIN is missing for file I/O

PHG display : 'WRITE_BEGIN expected'
Cause :
Correction : Check QLL program.

---

56 = File opened too often

PHG display : 'file repeat. opened'
Cause : File was opened for reading more than 127 times.
Correction : Check QLL program and/or previous operation.

Group 0 : Possible errors

57 = File still open (for example, during delete operation).

PHG display : 'file still open'
Cause : From version TO05H also used, if there is a write–access in BAPS (File–I/O) to a read–open file. In this case this file has to be closed by the "CLOSE"–command.
Correction : Check QLL–program and/or previous operation.

---

58 = Function illegal without reference point.

PHG display : 'inadmis.,no r.points'
Cause : Referencing not yet performed.
Correction : Referencing points must first be approached.

---

59 = The file end was reached for file I/O during a READ operation

PHG display : 'end of file reached'
Cause : Too many read operations.
Correction : Check QLL program. Use END_OF_FILE instruction.

---

60 = Negative line no. for file I/O.

PHG display : 'negative line–number'
Cause : A negative line number was specified during READ/WRITE access of a file (file I/O).
Correction : Check program.

---

61 = File does not exist for READ or WRITE.

PHG display : 'DAT–file missing'
Cause : Addressed file not found; incorrect name.
Correction : Check QLL program. Check memory contents.

---

62 = Read access illegal. File is open for writing.

PHG display : 'READ write–open file'
Cause : Read access for a file opened for writing.
Correction : Check QLL program.

---

63 = Instruction READ_BEGIN missing for file I/O.

PHG display : 'READ_BEGIN expected'
Cause :
Correction : Check QLL program.

---

64 = Error during parameter transfer to external sub-program

PHG display : 'parameter ext. prog.'
Cause :
Correction : Check QLL program.

Group 0 : Possible errors

65 = Illegal number of parameters during call of an external sub-program

PHG display : 'parameter number'
Cause :
Correction : Check QLL program.

---

66 = Incorrect parameter type during call of an external sub-program

PHG display : 'parameter type'
Cause :
Correction : Check QLL program.

---

67 = Incorrect parameter agreement during external sub-program call

PHG display : 'parameter declar.'
Cause :
Correction : Check QLL program.

---

68 = Program can only be run as an external sub-program

PHG display : 'program neads param.'
Cause : An external sub-program (with parameters) was started as a main program.
Correction : Check QLL program.

---

69 = Overflow in integer variable during ROUND and TRUNC.

PHG display : 'integer overflow'
Cause : Conversion results do not correspond to the permissible format for integer variable [–2 to the 31st .. +2 (to the 31st–1)].
Correction : Check QLL program.

---

70 = Error in the data format

PHG display : 'err. in data format'
Cause :
Correction : Check QLL program and used data.

---

71 = Passing factor too large

PHG display : 'Pass.factor–overflow'
Cause :
Correction :

---

72 = Currently not used

PHG display :
Cause :
Correction :

Group 0 : Possible errors

73 = Currently not used

PHG display :
Cause :
Correction :

---

74 = Heap overflow

PHG display : 'HEAP overflow'
Cause : System Heap limit has been reached.
Correction : Check system Heap limit.

---

75 = Reserved

PHG display :
Cause :
Correction :

---

76 = Starting point too close to intermediate point

PHG display : 'St/Int.pnt too close'
Cause : During circular interpolation the programmed starting point is too close to the intermediate point.
Correction : Check program correction, circle point.

---

77 = Starting point too close to end point

PHG display : 'St/End.pnt too close'
Cause : During circular interpolation the programmed starting point is too close to the end point.
Correction : Check circle point in the program.

---

78 = Reserved

PHG display :
Cause :
Correction :

---

79 = Only positive speeds permissible

PHG display : 'only pos. feed !'
Cause :
Correction :

---

80 = Reserved

PHG display :
Cause :
Correction :

Group 0 : Possible errors

81 = Reserved

PHG display :
Cause :
Correction :

---

82 = Intermediate point too close to end point

PHG display : 'Int/Endpnt too close'
Cause : During circular interpolation the intermediate point is too close to the end point.
Correction : Check circle point in the program.

---

83 = Starting, intermediate and end point on a line

PHG display : 'ST/Int /Endpnt = line'
Cause : The starting point and the intermediate point must not form a straight line with the end point.
Correction : Check circle point in the program.

---

84 = Starting, intermediate and end point too close

PHG display : 'Int/Endpnt too close'
Cause : The points are too close together for circular interpolation.
Correction : Check circle point in the program.

---

85 = Circular interpolation with max. 6 coordinates

PHG display : 'CIRC.: max. 6 coord.'
Cause :
Correction :

---

86 = Protocol error

PHG display : 'protocol error'
Cause : Program error during read/write operation
Correction : Check program regarding READ/WRITE.

---

87 = Illegal REAL output value

PHG display : 'inad. real outp. value'
Cause : Value is not in the valid range.
Correction : Check the Dez. output in the program.

---

88 = Belt counter outside of permissible range

PHG display : 'Value of beltcounter'
Cause : The belt counter has not been reset, or is outside of the range established in machine parameter P505.
Correction : Reset the belt counter (positive edge) or if necessary increase the range.

Group 0 : Possible errors

89 = Belt distance is zero

PHG display : 'beltdistance is zero'
Cause : For belt synchronization without parallel belt traversing capability (Belt type 2), the belt coordinate of two sequential traverse points is identical.
Correction : Program a belt distance unequal to zero.

---

90 = Point invalid for option BELT STOP

PHG display : 'Point is invalid'
Cause : By means of special function 31 (reads setpoints from the ring memory), a buffer is accessed which does not yet contain a valid point.
Correction : In special function 30 (= deactivates the storing of setpoints), the parameter NUMBER OF POINTS delivers the number of previously stored points ⇒ select a corresponding index for special function 31.

---

91 = Illegal measuring system

PHG display : 'Inadmiss. meas.sys.'
Cause : An incorrect measuring system number was programmed in special function 29 (= for activating the storing process for setpoints).
Correction : The maximum permissible measuring system number is yielded from MS_No_max = number of all axes + number of all belts + number of all analog inputs.

---

92 = Illegal belt type/tolerance

PHG display : 'wrong belt–kind/–tol'
Cause : An illegal belt type or an illegal belt tolerance was programmed when special function 21 was called.
Correction : Check QLL program.

---

93 = Illegal belt number

PHG display : 'Inadmiss. Belt–No'
Cause : There is no belt with the number specified in special function 21 or 28.
Correction :

---

94 = 'BNR–file missing'

PHG display : 'BNR–file missing'
Cause : Addressed file does not exist (e.g. wrong filename).
Correction : Check QLL–program. Check contents of the memory.

---

95 = MOVE_FILE: version identifier

PHG display : 'MF:version–identif.'
Cause : Error in parameter 5 of file header.
Correction :

---

96 = MOVE_FILE: wrong axis number

PHG display : 'MF:axisnumber'
Cause : Error in parameter 4 of file header.
Correction : Axis number in the MPP does not agree with the axis number in the file.

Group 0 : Possible errors

97 = MOVE_FILE: READ–marker error

PHG display : 'MF: READ–marker err.'
Cause : READ–marker of the BNR–file used with a wrong position in the READ_BEGIN command.
Correction : Check READ_BEGIN.

---

98 = MOVE_FILE: wrong time base

PHG display : 'MF: time–base'
Cause : Error in parameter 3 of file header.
Correction : The interpolation time (P5, clock start–time) does not agree with the time base of the BNR–file.

---

99 = MOVE_FILE: wrong interpolation–/positioning control time base

PHG display : 'MF:IP–PL–base'
Cause : Error in parameter 2 of file header.
Correction : The parameter "BASE" of SPC–Function 45 (MOVE_FILE) does not agree with the IP–PL–base of BNR–file.

---

100 = MOVE_FILE: Format error

PHG display : 'MF: format error'
Cause : READ–marker of the BNR–file is pointing to an incorrect value (not an IEEE–format).
Correction : Check READ_BEGIN, check BNR–file.

---

101 = MOVE_FILE: Modulo–Flag not initialized

PHG display : 'MF: MOD–Flag n. init'
Cause : The parameter "MODULO_FLAG" of SPC–Function 45 (MOVE_FILE) was not initialized in the BAPS–program.
Correction : Before calling SPC–Function 45, the parameter "MODULO_FLAG" must be initialized in the BAPS–program.

---

102 = MOVE_FILE: No endless axis

PHG display : 'MF: no endless–axis'
Cause : The Modulo–Flag of the currrent axis was assign to the value 1.0 or 2.0, although the axis wasn't declared as an endless axis in the MPP.
Correction : Check MPP (P303).

---

103 = MOVE_FILE: No reference points

PHG display : 'MF: no reference points'
Cause : There is a movement of a kinematics in a BAPS–process without reference points carried out.
Correction :

---

104 to 127 = Currently not used

PHG display :
Cause :
Correction :

---

128 to 135 = Switch-on position of the IOL function 1..8 was not reached
PHG display :
Cause :
Correction :

---

136 to 143 = Switch-off position of the IOL function 1..8 was not reached
PHG display :
Cause :
Correction :

---

144 to 151 = Switch-off position to close to switch-on position **IOL no.1–8**
PHG display :
Cause :
Correction :

---

152 to 159 = Programmed PPO position was not reached **PPO no. 1–8**
PHG display :
Cause :
Correction :

---

160 to 167 = Interpolator stop during PPO or IOL function **IOL/PPO no. 1–8**
PHG display :
Cause :
Correction :

---

168 to 175 = Process parameter output (PPO logic) still occupied **PPO no. 1–8**
PHG display :
Cause :
Correction :

---

176 to 183 = IOL function still occupied (active) **IOL no. 1–8**
PHG display :
Cause :
Correction :

---

184 to 191 = Illegal IOL/PPO function **IOL/PPO no. 1–8**
PHG display :
Cause :
Correction :

---

192 to 255 = Currently not used
PHG display :
Cause :
Correction :

9.2 Group 1 : CAN errors

256 to 261 = CAN logic voltage 5V/15V axis 1–6

PHG display : 'CAN Log.power 5V/15V'
Cause : Logic voltage of the drive modul defective.
Correction :

---

262 to 267 = CAN logic voltage 5V/15V axis 7–12

PHG display :
Cause :
Correction :

---

268 = Currently not used

PHG display :
Cause :
Correction :

---

269 = Currently not used

PHG display :
Cause :
Correction :

---

270 = Currently not used

PHG display :
Cause :
Correction :

---

271 = Currently not used

PHG display :
Cause :
Correction :

---

272 to 277 = CAN d.c. link voltage > 400V axis 1–6

PHG display : 'CAN Overvoltage'
Cause : Error messages of the drive amplifier:
– Temperature > 110 °C
– d.c. link voltage > 400V
– Phase loss for 100ms
Correction : If one or more of these conditions occur, the power transistors are switched off within a starting time.

---

278 to 283 = CAN d.c. link voltage > 400V axis 7–12

PHG display :
Cause :
Correction :

Group 1 : CAN errors

284 = Currently not used

PHG display :
Cause :
Correction :

---

285 = Currently not used

PHG display :
Cause :
Correction :

---

286 = Currently not used

PHG display :
Cause :
Correction :

---

287 = Currently not used

PHG display :
Cause :
Correction :

---

288 to 293 = CAN transistor temperature, axis 1–6

PHG display : 'CAN Bridge–temp'
Cause : The heat sink temperature of the power transistor is tested every second. If the temperature exceeds 85 °C, a bridge temperature error is reported and the drive is deactivated.
Correction :

---

294 to 299 = CAN transistor temperature, axis 7–12

PHG display :
Cause :
Correction :

---

300 = Currently not used

PHG display :
Cause :
Correction :

---

301 = Currently not used

PHG display :
Cause :
Correction :

Group 1 : CAN errors

302 = Currently not used

PHG display :
Cause :
Correction :

---

303 = Currently not used

PHG display :
Cause :
Correction :

---

304 to 309 = CAN motor temperature, axis 1–6

PHG display : 'CAN Motor–temp'
Cause : If the temperature of the motors exceeds 155 °C for 0.75 seconds, a motor temperature error is reported and the drive is deactivated.
Correction :

---

310 to 315 = CAN motor temperature, axis 7–12

PHG display :
Cause :
Correction :

---

316 = Currently not used

PHG display :
Cause :
Correction :

---

317 = Currently not used

PHG display :
Cause :
Correction :

---

318 = Currently not used

PHG display :
Cause :
Correction :

---

319 = Currently not used

PHG display :
Cause :
Correction :

---

320 to 325 = CAN resolver error, axis 1–6

PHG display : 'CAN Resolverfault'
Cause : The module of the cosine and sine signals of the resolvers is checked each communication cycle. If less than half of the values checked are correct, an error message is reported.
Correction :

Group 1 : CAN errors

326 to 331 = CAN resolver error, axis 7–12

PHG display :
Cause :
Correction :

---

332 = Currently not used

PHG display :
Cause :
Correction :

---

333 = Currently not used

PHG display :
Cause :
Correction :

---

334 = Currently not used

PHG display :
Cause :
Correction :

---

335 = Currently not used

PHG display :
Cause :
Correction :

---

336 to 341 = CAN parameter error, axis 1–6

PHG display : 'CAN Parameterfault'
Cause : A parameter error has occurred if, due to an initialization error or RAM defect, no valid parameters or no valid software is available for the drive. All parameters are acquired by a checksum which is checked every 64 communication cycles. If the checksum is incorrect, an error message is reported.
Correction :

---

342 to 347 = CAN parameter error, axis 7–12

PHG display :
Cause :
Correction :

---

348 = Currently not used

PHG display :
Cause :
Correction :

---

349 = Currently not used

PHG display :
Cause :
Correction :

Group 1 : CAN errors

350 = Currently not used

PHG display :
Cause :
Correction :

---

351 = Currently not used

PHG display :
Cause :
Correction :

---

352 to 357 = CAN temperature warning, axis 1–6

PHG display : 'CAN Thermalwarning'
Cause : If the temperature of the motors exceeds 130 °C for 0.75 seconds, or the heat sink temperature of the power transistors exceeds 70 °C, the drive issues a "Thermal overload warning" to the rho3.
Correction :

---

358 to 363 = CAN temperature warning, axis 7–12

PHG display :
Cause :
Correction :

---

364 = Currently not used

PHG display :
Cause :
Correction :

---

365 = Currently not used

PHG display :
Cause :
Correction :

---

366 = Currently not used

PHG display :
Cause :
Correction :

---

367 = Currently not used

PHG display :
Cause :
Correction :

---

368 to 373 = CAN short-circuit error, axis 1–6

PHG display : 'CAN Short–circuit'
Cause : Each of the three motor phases are equipped with a current sensor. If a short-circuit lasts longer than 5 microseconds, the power transistors are switched off and an error is reported.
Correction :

Group 1 : CAN errors

374 to 379 = CAN short-circuit error, axis 7–12

PHG display :
Cause :
Correction :

---

380 to 381 = CAN–Bus: Inadmissible data

PHG display : 'inadm. data CAN*x* E*y*'
x = number of the CAN–Bus, *y* = number of the input block
Cause : The CAN input module has transmitted data at a prohibited time.

PHG display : 'inadm. data CAN*x* A*y*'
x = number of the CAN–Bus, *y* = number of the output block
Cause : Write access to the CAN module is disabled.
Correction : CAN modul in the rho3 is defect.

---

382 to 383 = No transmission of the CAN–Input–Module

PHG display : 'no transm. CAN*x* E*y*'
x = number of the CAN–Bus, *y* = number of the input block
Cause : No data of the CAN–input module received for at least one P2–cycle.
Correction : Check CAN–Bus connection (connector, cable). Input module defect.

---

384 to 389 = CAN, no sync. byte, axis 1–6

PHG display : 'CAN no sync.–telegr.'
Cause : No synchronization telegrams are received during a communcation cycle.
Correction :

---

390 to 395 = CAN, no sync. byte, axis 7–12

PHG display :
Cause :
Correction :

---

396 to 399 = Currently not used

PHG display :
Cause :
Correction :

---

400 to 405 = Currently not used

PHG display :
Cause :
Correction :

Group 1 : CAN errors

406 to 411 = Currently not used

PHG display :
Cause :
Correction :

---

412 to 415 = Currently not used

PHG display :
Cause :
Correction :

---

416 to 421 = CAN, no setpoint, axis 1–6

PHG display : 'CAN No comm.–telegr.'
Cause : No COMMAND–telegram received within 2ms after a synchronization procedure.
Correction :

---

422 to 427 = CAN, no setpoint, axis 7–12

PHG display :
Cause :
Correction :

---

428 to 431 = Currently not used

PHG display :
Cause :
Correction :

---

432 to 437 = CAN, no actual value, axis 1–6

PHG display : 'CAN No act.– telegr.'
Cause : The ACTUAL–telegram can not be transmitted by the drive.
Correction :

---

438 to 443 = CAN, no actual value, axis 7–12

PHG display :
Cause :
Correction :

---

444 to 447 = Currently not used

PHG display :
Cause :
Correction :

---

448 to 463 = Currently not used

PHG display :
Cause :
Correction :

Group 1 : CAN errors

464 to 469 = CAN lag error, axis 1–6

PHG display : 'CAN Lag– fault'
Cause : The drive dynamic lag monitoring has responded.
Correction :

---

470 to 475 = CAN lag error, axis 7–12

PHG display :
Cause :
Correction :

---

476 to 495 = Currently not used

PHG display :
Cause :
Correction :

---

496 to 501 = Global CAN error, axis 1–6

PHG display : 'global CAN–Fault'
Cause : Set by the logic module as soon as it recognizes a state that prevents drive enable.
Correction :

---

502 to 507 = Global CAN error, axis 7–12

PHG display :
Cause :
Correction :

---

508 to 511 = Currently not used

PHG display :
Cause :
Correction :

9.3 Group 2 : P2 errors, measuring system

512 to 517 = General CAN error, CAN alarm, axis 1–6

PHG display : 'CAN–alarm'
Cause : CAN–Bus connection interrupted. Action periods (clock start–time) does not agree. Drive amplifier was switch to function generator operation.
Correction :

---

518 to 523 = General CAN error, CAN alarm, axis 7–12

PHG display :
Cause :
Correction :

---

524 to 527 = Currently not used

PHG display :
Cause :
Hinweis :

---

528 = EMERGENCY STOP input

PHG display :
Cause :
Correction :

---

529 to 535 = Currently not used

PHG display :
Cause :
Correction :

---

536 to 545 = Traverse range limit reached (no belt sync.) Kinematics 1 – 10

PHG display :
Cause :
Correction :

---

546 to 551 = Currently not used

PHG display :
Cause :
Correction :

---

552 to 561 = Ambiguity for coord.sys.change (no belt sync.) Kinematics 1 – 10

PHG display :
Cause :
Correction :

---

562 to 567 = Currently not used

PHG display :
Cause :
Correction :

Group 2 : P2 errors, measuring system

568 to 575 = Traverse range limit (for belt sync.), belt 1–8
PHG display :
Cause :
Correction :

---

576 to 583 = Max. axis speed exceeded (for belt sync.), belt 1–8
PHG display :
Cause :
Correction :

---

584 to 593 = Ambiguity for coord.sys.change (belt sync.) Kinematics 1–10
PHG display :
Cause :
Correction :

---

594 to 599 = Currently not used
PHG display :
Cause :
Correction :

---

600 to 619 = Max. axis speed exceeded, axis 1–20
PHG display :
Cause :
Correction :

---

620 to 623 = Currently not used
PHG display :
Cause :
Correction :

---

624 to 643 = Axis traverse range limit reached, axis 1–20
PHG display :
Cause :
Correction :

---

644 to 647 = Currently not used
PHG display :
Cause :
Correction :

---

648 to 667 = Machine limit switch, axis 1–20
PHG display :
Cause :
Correction :

Group 2 : P2 errors, measuring system

668 to 671 = Currently not used

PHG display :
Cause :
Correction :

---

672 to 691 = Measurement system check-back signal faulty, axis 1–20

PHG display : 'meas.sys.feedb.error'
Cause : Too few pulses are reported between two marker signals for incremental encoders.
A different number of pulses are transferred during double transmission for absolute encoders.
The cause may be an incorrect setting of machine parameter P401 (marker interval). It may also be that pulses are lost (for example, due to malfunctions, dirt in the encoder).
Correction : Check machine parameter P401 and encoder.

---

692 to 695 = Currently not used

PHG display :
Cause :
Correction :

---

696 to 715 = Measuring system marker error, axis 1–20

PHG display : 'meas.sys.marker err.'
Cause : Too many pulses are reported between two markers for incremental encoders.
The cause may be an incorrect setting of machine parameter P401 (marker interval). It may also be that pulses are lost (for example, due to malfunctions, dirt in the encoder).
Correction : Check machine parameter P401 and encoder.

---

716 to 719 = Currently not used

PHG display :
Cause :
Correction :

---

720 to 739 = Measuring system alarm, axis 1–20

PHG display : 'meas. system alarm'
Cause : For incremental encoders: Cable break
For absolute encoders: Encoder power failure, hardware error on the module card
For potentiometer measuring system: Cable break or short-circuit
Correction : Check hardware (encoder, cable, servo card)

---

740 to 767 = Currently not used

PHG display :
Cause :
Correction :

9.4 Group 3 : Servo errors, In–position errors

768 = Axis processor stationary, servo card 1

PHG display :
Cause :
Correction :

---

769 = Axis processor stationary, servo card 2

PHG display :
Cause :
Correction :

---

770 = Axis processor stationary, servo card 3

PHG display :
Cause :
Correction :

---

771 to 775 = Currently not used

PHG display :
Cause :
Correction :

---

776 to 795 = servo error, axis 1–20

PHG display :
Cause :
Correction :

---

796 to 799 = Currently not used

PHG display :
Cause :
Correction :

---

800 to 819 = Interpolator stop error, axis 1–20

PHG display : ’interpolator stop’
Cause :
Correction :

---

820 to 823 = Currently not used

PHG display :
Cause :
Correction :

Group 3 : Servo errors, In–position errors

824 to 843 = Non–In–pos. error, axis 1–20
PHG display : '<IN POSITION>–Error'
Cause :
Correction :

---

844 to 847 = Currently not used
PHG display :
Cause :
Correction :

---

848 to 867 = Drive on, no enable, axis 1–20
PHG display :
Cause :
Correction :

---

868 to 871 = Currently not used
PHG display :
Cause :
Correction :

---

872 to 891 = No feed enable, axis 1–20 (planned)
PHG display :
Cause :
Correction :

---

892 to 895 = Currently not used
PHG display :
Cause :
Correction :

---

896 to 919 = Drive on illegal, axis 1–20
PHG display :
Ursache :
Hinweis :

---

920 = No servo card voltage
PHG display :
Cause :
Correction :

Group 3 : Servo errors, In–position errors

921 to 927 = Currently not used

PHG display :
Cause :
Correction :

---

928 to 937 = Incorrect belt direction (for belt sync./type 2 or 3) kinematics 1–10

PHG display : 'wrong belt–direction'
Cause : While belt synchronization was active with belt type 2, the belt moves opposite of the direction specified by the belt coordinates.
Correction : If required, activate belt synchronization later. Do not change the belt direction on the contour.

---

938 to 943 = Currently not used

PHG display :
Cause :
Correction :

---

944 to 953 = Belt direction outside of tolerance range (for belt sync./type 2 or 3) kinematics 1–10

PHG display : 'BS–tolerance too big'
Cause : While belt synchronization is active with belt type 2, the belt position deviates at the beginning of a traverse block too far from the programmed belt position.
Correction : The path is too short for the programmed A, AFACTOR, DFACTOR. (Trilinear fall for speed gradient)
Deviations in belt speed.

---

954 to 1023 = Currently not used

PHG display :
Cause :
Correction :

9.5 Group 4 : Miscellaneous errors

1024 = No power supply I/O card(s) (64I/40O)

PHG display :
Cause :
Correction :

1025 to 1031 = Currently not used

PHG display :
Cause :
Correction :

1032 = PIC250 timer error

PHG display :
Cause :
Correction :

1033 = PIC250 cycle active

PHG display :
Cause :
Correction :

1034 = PIC250 checksum error

PHG display :
Cause :
Correction :

1035 = PIC250–EEPROM overflow

PHG display :
Cause :
Correction :

1036 = PIC250 write protection

PHG display :
Cause :
Correction :

1037 = PIC250–EEPROM error

PHG display :
Cause :
Correction :

1038 to 1039 = Currently not used

PHG display :
Cause :
Correction :

Group 4 : Miscellaneous errors

1040 = RAM error PLC coupling

PHG display :
Cause :
Correction :

1041 = PLC coupling, timer error

PHG display : 'time error PLC link'
Cause : Time between two I/O images to the PLC is >250ms + clock time (parameter P5)
Correction :

1042 = PLC prog. runtime < –2ms

PHG display : 'PLC program <= –2 ms'
Cause : Hardware or software error or PLC program runtime ⇐ 2ms.
Correction :

1043 to 1046 = Currently not used

PHG display :
Cause :
Correction :

1047 = Control not ready

PHG display : 'control not ready'
Cause : "Emergency mode"
Correction :

1048 to 1067 = Error offset, axis 1–20

PHG display :
Cause :
Correction :

1068 = The external process deselection is illegal

PHG display : 'Ext.proc.stop inadm.'
Cause : Either BAPS test is active, or the strobe for external program selection or Auto start is pending.
Correction : PLC program, check whether the signals have been properly set.

1069 = Selecting the program INIT.IRD with Auto start is prohibited.

PHG display : 'INIT select. inadm.'
Cause : Either BAPS test is active, or an error has occurred which does not allow execution of programs with axis movements (EMERGENCY STOP, no controller enable, manual mode, etc.).
Correction : Check the PLC program. Under "DIAGNOSIS", check the current error and system status.

1070 = External program selection is prohibited because BAPS test is active.

PHG display : 'not allowed if test'
Cause : BAPS test is selected and active.
Correction : Conclude test.

Group 4 : Miscellaneous errors

1071 = An error occurred during Auto start

PHG display : 'INIT selection:error'
Cause : Process is already selected.
Correction : Abort INIT and reselect or restart the selected INIT program.

1072 = Parity error for external program selection/deselection

PHG display : 'Par.err. on prog.sel'
Cause : The parity determined in the control on the data channel does not agree with the parity bit and the parity set with machine parameters.
Correction : Check PLC program and machine parameters.

1073 = No file EXPROG.DAT for external program selection/deselection

PHG display : 'EXPROG.DAT not avail'
Cause : No EXPROG.DAT file.
Correction : Load the file with the programming unit (ROPS) or create it with the editor on the PHG.

1074 = File EXPROG.DAT opened too often, for example for reading

PHG display : 'max. open EXPROG.DAT'
Cause : The file was opened too often by means of read access operations, for example, from user processes.
Correction : Check programs.

1075 = The EXPROG.DAT file is faulty

PHG display : 'Error in EXPROG.DAT'
Cause : The EXPROG.DAT file contains illegal characters or the specified format has not been maintained.
Correction : Check the EXPROG.DAT file.

1076 = The file selected by external program selection/deselection can not be found

PHG display : 'Progr. not available'
Cause : A program was selected which is not in the user memory.
Correction : Make list of programs, check syntax in the EXPROG.DAT file, and if required correct or reload the file.

1077 = The process selected by external program selection already exists

PHG display : 'proc. already exists'
Cause : A process was selected which has already been selected or is already active.
Correction : Check PLC program and BAPS programs for "double" selection.

1078 to 1279 = Currently not used

PHG display :
Cause :
Correction :

9.6 Group 5 : Warnings

1280 to 1299 = Interpolator stop warning, axis 1–20

PHG display :
Cause :
Correction :

1300 to 1303 = Currently not used

PHG display :
Cause :
Correction :

1304 = Power supply I/O card(s) (64I/40O) was interrupted

PHG display :
Cause :
Correction :

1305 to 1311 = Currently not used

PHG display :
Cause :
Correction :

1312 = Buffer battery voltage too low

PHG display :
Cause :
Correction :

1313 to 1319 = Currently not used

PHG display :
Cause :
Correction :

1320 to 1339 = Warning, offset, axis 1–20

PHG display :
Cause :
Correction :

1340 to 1535 = Currently not used

PHG display :
Cause :
Correction :

9.7 Group 6 through 12 :

1536 to 1547 = SYNC–error during CAN–Parameter–Transmission

PHG display : 'CAN–Param. No SYNC'
Cause :
Correction :

1548 to 1551 = Currently not used

PHG display :
Cause :
Correction :

1552 to 1563 = Error during CAN–Parameter–Transmission

PHG display : 'CAN–Param–Trans.Err'
Cause :
Correction :

1564 to 1567 = Currently not used

PHG display :
Cause :
Correction :

1568 to 1579 = Incorrect drive parameters

PHG display : 'CAN–Param. EEPROM'
Cause : Error during EEPROM–programming.
Correction : EEPROM on amplifier module defective.

PHG display : 'CAN–Param. P602'
Cause : MPP–amplifier type does not agree with existing amplifier.
Correction : Check P602. Check amplifier type.

PHG display : 'CAN–Param. P603'
Cause : Inadmissible motor type.
Correction : Check P603. Check motor type (type plate).

PHG display : CAN–Param. P5'
Cause : Inadmissible P2–action period.
Correction : Check P5. Permissible range of CAN–coupling: 6..32 ms.

PHG display : 'CAN–Param. P604'
Cause : P–portion of governor not in permissible range.
Correction : Check P604. Notice specification of drive amplifier.

PHG display : 'CAN–Param. P605'
Cause : I–portion of governor not in permissible range.
Correction : Check P605. Notice specification of drive amplifier.

Group 6 through 12 :

PHG display : 'CAN–Param. P606'
Cause : Loop gain of positioning control not in permissible range.
Correction : Check P605. Notice specification of drive amplifier.

PHG display : 'CAN–Param. Lim. sw.'
Cause : Limit switch position not in permissible range.
Correction : Check P204, P205, P206, P207, P208.

PHG display : 'CAN–Param. P607'
Cause : Torque limit not in permissible range.
Correction : Check P607. Notice specification of drive amplifier.

PHG display : 'CAN–Param. P103'
Cause : Speed limit in automatic mode not in permissible range.
Correction : Check P23, P103. Notice specification of drive amplifier.

PHG display : 'CAN–Param. P114'
Cause : Speed limit in manual mode not in permissible range.
Correction : Check P23, P114. Notice specification of drive amplifier.

PHG display : 'CAN–Param. P608'
Cause : Emergency deceleration ramp not in permissible range.
Correction : Check P608. Notice specification of drive amplifier.

PHG display : 'CAN–Param. P609'
Cause : Deceleration speed not in permissible range.
Correction : Check P609. Notice specification of drive amplifier.

PHG display : 'CAN–Param. P610'
Cause : Max. static position error not in permissible range.
Correction : Check P610. Notice specification of drive amplifier.

PHG display : 'CAN–Param. P611'
Cause : Max. nominal lag error relating to the motor speed not in permissible range.
Correction : Check P611. Notice specification of drive amplifier.

PHG display : 'CAN–Param. P612'
Cause : Damping ratio of the 2nd class fliter not in permissible range.
Correction : Check P612. Notice specification of drive amplifier.

PHG display : 'CAN–Param. CPS'
Cause : Inadmissible value of CAN–Position–Scaling.
Correction : Check P401 (pulses/rotation). Notice specification of drive amplifier.

PHG display : 'CAN–Param. P614'
Cause : Value of the "home position offset" not in permissible range.
Correction : Check P614 (permissible range: 0..360 [degr]).

Group 6 through 12 :

PHG display : 'CAN–Param. dir. rotat.'
Cause : Error during transmission of parameter "rotation direction".
Correction : Drive amplifier probably defect.

PHG display : 'CAN–Param. P615'
Cause : Error during transmission of parameter "overtemp–protection on/off".
Correction : Check P615. Check drive amplifier.

1580 to 3327 = Currently not used

PHG display :
Cause :
Correction :

9.8 Group 13 : P2 runtime errors with rho3.2

3328 = NMI

PHG display :
Cause :
Correction :

3329 = Abort

PHG display :
Cause :
Correction :

3330 = FPU

PHG display :
Cause :
Correction :

3331 = Illegal operand

PHG display :
Cause :
Correction :

3332 = SVC trap

PHG display :
Cause :
Correction :

3333 = Division by zero

PHG display :
Cause :
Correction :

3334 = Flag trap

PHG display :
Cause :
Correction :

3335 = Interruption position

PHG display :
Cause :
Correction :

Group 13 : P2 runtime errors with rho3.2

3336 = TRACE trap

PHG display :
Cause :
Correction :

3337 = Undefined operation code

PHG display :
Cause :
Correction :

3338 = Incorrect clock mode

PHG display :
Cause :
Correction :

3339 = Incorrect clock in–type

PHG display :
Cause :
Correction :

3340 = RAM error

PHG display :
Cause :
Correction :

3341 = P2 checksum error

PHG display :
Cause :
Correction :

3342 = CP1 not updated

PHG display :
Cause :
Correction :

3343 = NVI with error

PHG display :
Cause :
Correction :

3344 = P2 Clock overflow

PHG display :
Cause :
Correction :

Group 13 : P2 runtime errors with rho3.2

3345 = Incorrect LOOP mode

PHG display :
Cause :
Correction :

3346 to 3583 = Currently not used

PHG display :
Cause :
Correction :

9.9 Group 14 : System errors

3584 = Currently not used

PHG display :
Cause :
Correction :

3585 = System error 2 : P2 does not run

PHG display : 'P2 not working'
Cause : Watchdog between processor P1 and P2 responded. Processor P2 no longer works.
Correction : a) Watchdog (machine parameter 6) set too accurately.
⇒ Increase value of P6 (only after consulting with BOSCH)
b) Clock starting time (machine parameter 5) is set too low.
⇒ Increase value of P5 (only after consulting with BOSCH)
c) Hardware of the CP card is defective.

3586 = System error 3 : transformation error

PHG display : 'Transformation error'
Cause : FPU trap in the transformation.
Correction : a) No FPU to processor P2.
b) For example, division by zero in the transformation.
⇒ Inform Bosch!

3587 = System error 4 : parity error on MEM

PHG display : 'parity error on MEM'
Cause : A parity error occurred on the memory module of the rho3.2, which may occur, for example, due to defective RAM modules (hardware error) or due to a read access operation on non-existant modules (software error).
Correction : The error can only be reset by resetting on the power supply module of the rho3.2 or by switching the unit off and then on again. If there is a hardware error, the memory module must be replaced.

3588 = System error 5 : incorrect Heap pointer

PHG display :
Cause :
Correction :

3589 = System error 6 : I/O counter overflow

PHG display :
Cause :
Correction :

3590 = System 7 : B_CONTROL faulty

PHG display : 'Error in B_STEUER'
Cause : Change of coordinate from JC to WC which was not correctly recognized by control.
Correction : Faulty software (inform Bosch!).

Group 14 : System errors

3591 = Currently not used

PHG display :
Cause :
Correction :

3592 = System 9 : P2 checksum error

PHG display : 'P2 checksum error'
Cause : The RAM checksum monitoring of the P2 processor responded for the CP–2.5.
Correction : a) RAM modules are defective.
b) Code was destroyed by faulty software.

3593 to 3595 = Currently not used

PHG display :
Cause :
Correction :

3596 = System error 13 : RAM write protection violation

PHG display : 'RAM write prot. hurt'
Cause : Faulty software writes in protected memory.
Correction : The write operation is not executed meaning that no data are destroyed.

3597 = Currently not used

PHG display :
Cause :
Correction :

3598 = Currently not used

PHG display :
Cause :
Correction :

3599 = System 16 : Time format in WAITFORRXR

PHG display :
Cause :
Correction :

3600 = System error 17 : no RXR Bit RS422 Int.

PHG display :
Cause :
Correction :

Group 14 : System errors

3601 = System error 18 : incorrect interrupt DNC

PHG display :
Cause :
Correction :

3602 = System error 19 : incorrect NVI interrupt.

PHG display :
Cause :
Correction :

3603 = System error 20 : SVC no. 6

PHG display :
Cause :
Correction :

3604 = System error 21 : NMI

PHG display :
Cause :
Correction :

3605 = System error 22 : Abort

PHG display :
Cause :
Correction :

3606 = System error 23 : FPU trap

PHG display : 'FPU trap'
Cause : Data are accessed which do not correspond to floating-point representation.
Correction :

3607 = System error 24 : illegal operand

PHG display : 'bad Operand'
Cause : Either due to a defective EPROM module, or due to "wildly" jumping around in the operating system, the processor accesses an illegal operand.
Correction :

3608 = System error 25 : SVC trap

PHG display :
Cause :
Correction :

Group 14 : System errors

3609 = System error 26 : division by zero

PHG display :
Cause :
Correction :

3610 = System error 27 : FLAG trap

PHG display :
Cause :
Correction :

3611 = System error 28 : Breakpoint trap

PHG display :
Cause :
Correction :

3612 = System error 29 : TRACE trap

PHG display :
Ursache :
Hinweis :

3613 = System error 30 : Undefined operation code

PHG display : 'undef. operationcode'
Cause : Either due to a defective EPROM module, or due to "wildly" jumping around in the operating system, the processor accesses an illegal operand.
Correction :

3614 = System error 31 : Error : Dualport test

PHG display : 'error:dual–port–test'
Cause : Dualport memory is defective.
Correction :

3615 = System error 32 : Interface : RS 422 interface

PHG display :
Cause :
Correction :

3616 = System error 33 : Error : RAM test

PHG display : 'error:RAM test'
Cause : During the RAM test an error is detected in a RAM module.
Correction :

3617 = System error 34 : Error : Reload text

PHG display :
Cause :
Correction :

Group 14 : System errors

3618 = System error 35 : HEAP overflow

PHG display :
Cause :
Correction :

3619 = System error 36 : Negative argument SQRT

PHG display :
Cause :
Correction :

3620 = System error 37 : DISPOSE error

PHG display :
Cause :
Correction :

3621 = System error 38 : SYSTEM ERROR 300

PHG display :
Cause :
Correction :

3622 = Currently not used

PHG display :
Cause :
Correction :

3623 = System error 40 : Illegal interpolation type

PHG display :
Cause :
Correction :

3624 to 3627 = Currently not used

PHG display :
Cause :
Correction :

3628 = System error 45 : TASK not in NOTQ

PHG display : 'TASK not in NOTQ'
Cause : Error in the task management of the operating system.
Correction :

3629 = System error 46 : No STOP in Task

PHG display : 'no STOP in task'
Cause : Error in the operating system task.
Correction :

Group 14 : System errors

3630 = System error 47 : TASK can not be transferred

PHG display :
Cause :
Correction :

3631 = System error 48 : TTY I/O from several TASKS

PHG display :
Cause :
Correction :

3632 = Currently not used

PHG display :
Cause :
Correction :

3633 = System error 50 : Stack overflow

PHG display :
Cause :
Correction :

3634 = System error 51 : Task–Stack overflow

PHG display : ’task stack overflow’
Cause : Stack requirements for active task exceeded.
Correction :

3635 = System error 52 : EMX internal stack overflow

PHG display : ’
Cause :
Correction :

3636 = System error 53 : EMX NO TASK READY

PHG display : ’EMX no task ready’
Cause : Too many user processes have been initialized.
Correction : Change machine parameter P7:
Increase EMX heap, reduce SYS heap until the error no longer occurs.
If the SYS heap is still insufficient (P1 runtime error, SYS heap overflow), a larger memory is required, or the number of processes (Parallel/Else) must be reduced.

3637 = System error 54 : EMX heap overflow

PHG display :
Cause :
Correction :

Group 14 : System errors

3638 = System error 55 : EMX Dispose error

PHG display : 'EMX Dispose error'
Cause : EMX releases heap range which is outside of the permissible limits.
Correction :

3639 = System error 56 : EMX Release error

PHG display :
Cause :
Correction :

3640 = System error 57 : EMX heap fatal error

PHG display : 'EMX Heap fatal err.'
Cause : General EMX heap error. Negative EMX heap length in MEMAVAIL.
Correction :

3641 = System error 58 : Task management: P–TCB–CREATE

PHG display : 'Task already exists'
Cause :Error while creating the task–control–block of a user process.
Task–control–block already already exists.
Correction :

3642 to 3644 = Currently not used

PHG display :
Cause :
Correction :

3645 = System error 62 : PG4 coupling unknown function

PHG display :
Cause : Internal unknown function.
Correction :

3646 = System error 63 : PG4 coupling block too large

PHG display :
Cause : Transmission block too large.
Correction :

3647 to 3665 = Currently not used

PHG display :
Cause :
Correction :

3666 = System error 83 : Illegal device address

PHG display :
Cause :
Correction :

3667 to 3683 = Currently not used

PHG display :
Cause :
Correction :

Group 14 : System errors

3684 = System error 101 : Incorrect servo card provision

PHG display : 'incorr. servo–board'
Cause : Incorrect servo card provision applied by means of machine parameter P15. It is possible that:
– the number of the available servo cards –
the servo card types
– the numbering of the servo cards do not agree with P15.
Correction : Change machine parameter P15.

3685 = System error 102 : Incorrect measuring system card provision

PHG display : 'incorr.comp. servo–b'
Cause : Incorrect measuring card provision applied by means of machine parameter P401. It is possible that:
– servo cards of a measuring system
– plug no. of a measuring system
– module no. of a measuring system do not agree with P401.
Correction : Change machine parameter P401.

3686 = System error 103 : Potentiometer adjustment not possible

PHG display : 'adj. of pot.not poss.'
Cause : Potentiometer adjustment not possible.
Correction :

3687 = System error 104 : MODE <> 0 : RAM ERROR

PHG display : 'MODE <> 0: RAM–ERROR'
Cause : CP–2.5: RAM of the interface processor or the P2 processor is defective.
Correction : Hardware defect.

3688 = System error 105 : MODE does not become 0

PHG display : 'MODE don't turn to 0'
Cause : CP–2.5: Preloading for interface processor or P2 processor not possible.
Correction : Hardware defect / not completely equipped.

3689 = System error 106 : MODE <> 2 : CODE ERROR

PHG display : 'MODE <> 2: CODE–ERROR'
Cause : Downloading for interface processor, P2 processor, or axis processor not possible.
Correction : Hardware defect / not completely equipped.

Group 14 : System errors

3690 = System error 107 : MODE does not become 2

PHG display : 'Mode don't turn to 2'
Cause : CP–2.5: Interface processor or P2 processor jump incorrectly in RAM.
Correction : Faulty software.

3691 = System error 108 : MODE does not become 4

PHG display : 'Mode don't turn to 4'
Cause : Interface processor or P2 processor incorrectly retrieve machine parameters.
Correction : Faulty software.

3692 = System error 109 : Incorrect allocation axis –> servo card

PHG display : 'incor.assig.axis–>SB'
Cause : Incorrect axis-servo card allocation.
An axis was assigned to a non-existent servo card by means of machine parameter P401 (axis suspended in air).
Correction : Change P401 (does not agree with P15).

3693 = System error 110 : P2–RAM insufficient for kinematics download

PHG display : 'P2RAM–Err.Kin–Dload'
Cause : CP-2.5: The RAM of the P2 processor is insufficient for downloadin the transformation modules. Too many kinematics with differing transformations are applied.
Correction : Reduct the numbe of kinematics.

3694 to 3713 = Currently not used

PHG display :
Cause :
Correction :

3714 = System error 131 : MODE does not become 6

PHG display : 'Mode don't turn to 6'
Cause : Axis processor preload function inoperable.
Correction : Hardware defect / not completely equipped.

3715 = System error 132 : MODE does not become 8

PHG display : 'Mode don't turn to 8'
Cause : Axis processor download initialization function inoperable.
Correction : Hardware defect / not completely equipped.

3716 = System error 133 : MODE does not become 10

PHG display : 'Mode don't turn to 10'
Cause : Axis processor download function inoperable.
Correction : Hardware not completely equipped (for example, no FPU).

Group 14 : System errors

3717 = System error 134 : MODE does not become 12

PHG display : 'Mode don't turn to 12'
Cause : machine parameter transmission to the axis processor is inoperable.
Correction : Faulty software.

3718 = System error 135 : MODE does not become 14

PHG display : 'Mode don't turn to 14'
Cause : Check–back signal function of the P2 version is inoperable.
Correction : Faulty software.

3719 = System error 136 : MODE does not become 16

PHG display : 'Mode don't turn to 16'
Cause : Dualport initialization from P2 does not work.
Correction : Faulty software.

3720 = System error 137 : SK_OUT gap / double assignment

PHG display : 'SB–OUT–gap/–double
Cause : The applied setpoint outputs of a servo card must each be consecutively numbered starting at 1. This applies to the axes (P401) as well as to the analog outputs (P405). Though their order is unimportant, there must be no gaps or double assignments.
Correction : Assign the sub-parameter setpoint outputs in P401 and P405 so that consecutive numbering results.

3721 = System error 138 : RTYP axis number too small

PHG display : 'num. of ax. too small''
Cause : The number of axes set with P302 is too small for the current robot type (P306). This would result in an FPU trap in the coordinate transformation.
Correction : Increase the number of axes (P302) appropriate to the robot type.

3722 = System error 139 : Singular equational system

PHG display : 'singular EQS'
Cause : The equational system for skew angle portals in the coordinate transformation is singular. This means that the reverse transformation cannot be calculated.
Correction : Change the angle deviations (P307).

Group 14 : System errors

3723 = System error 140 : MODE does not become 1

PHG display : 'Mode don't turn to 1'
Cause : When controlling with the CAN interface, the digital drives are not ready.
Correction : a) Parameter error (for example, CLOCK–TIME) does not agree with the digital drives.
b) No voltage for the drives.
c) Faulty transmission via CAN bus.

3724 = System error 141 : Currently not used

PHG display :
Cause :
Correction :

3725 = System error 142 : P2 clock scaler too small

PHG display : 'Div.P2clock too small'
Cause : A scaler set in machine parameter P5 in the P2 clock time is too small. The quotient P2 clock time/scaler must be less than 6ms; otherwise, the hardware end Ready status of the Servo-i drops off and can no longer be retriggered.
Correction : Only after consulting with BOSCH: Increase the scaler in machine parameter P5 (or reduce the clock starting time).

3726 = System error 143 : Currently not used

PHG display :
Cause :
Correction :

3727 = System error 144 : RTC value too large

PHG display : 'RTC_VALUE too large'
Cause : The maximum value with which the RTC timer can be set has been exceeded.
Correction : Only after consulting with BOSCH: Reduce the scaler in machine parameter P5 (or increase the clock starting time).

3728 = System error 145 : RTC value too small

PHG display : 'RTC_VALUE too small'
Cause : The minimum value with which the RTC timer can be set has not been reached.
Correction : Only after consulting with BOSCH: Reduce the scaler in machine parameter P5 (or increase the clock starting time).

Group 14 : System errors

3729 = System error 146 : P2 clock inaccurate

PHG display : 'P2–Clock inaccurate'
Cause : The desired P2 clock starting time cannot be precisely set with the Timer. This would cause incorrect traverse movement speeds.
Correction : Only after consulting with BOSCH: The clock starting time * 1250 set with machine parameter P5 must be divisible, in intergers, by the smallest common multiple of the scaler.

3730 = System error 147 : Currently not used

PHG display :
Cause :
Correction :

3731 = System error 148 : Currently not used

PHG display :
Cause :
Correction :

3732 = System error 149 : Currently not used

PHG display :
Cause :
Correction :

3733 = System error 150 : Currently not used

PHG display :
Cause :
Correction :

3734 = System error 151 : Currently not used

PHG display :
Cause :
Correction :

3735 = System error 152 : NMI

PHG display :
Cause :
Correction :

3736 = System error 153 : Abort

PHG display :
Cause :
Correction :

Group 14 : System errors

3737 = System error 154 : FPU error

PHG display :
Cause :
Correction :

3738 = System error 155 : illegal operand

PHG display :
Cause :
Correction :

3739 = System error 156 : SVC with error

PHG display :
Cause :
Correction :

3740 = System error 157 : Division by zero

PHG display :
Cause :
Correction :

3741 = System error 158 : FLAG trap

PHG display :
Cause :
Correction :

3742 = System error 159 : Interruption position

PHG display :
Cause :
Correction :

3743 = System error 160 : TRACE trap

PHG display :
Cause :
Correction :

Group 14 : System errors

3744 = System error 161 : Undefined operation code

PHG display :
Cause :
Correction :

3745 = System error 162 : Incorrect clock mode

PHG display :
Cause :
Correction :

3746 = System error 163 : Incorrect clock in-type

PHG display :
Cause :
Correction :

3747 = System error 164 : RAM error

PHG display :
Cause :
Correction :

3748 = System 165 : P2 checksum error

PHG display : ’P2 checksum error’
Cause : The RAM checksum monitoring of the P2 processor responded for the CP–2.5.
Correction : a) RAM modules are defective.
b) Code was destroyed by faulty software.

3749 = System error 166 : CP1 not updated

PHG display : ’CP1 not updated’
Cause : Watchdog between processor P1 and P2 responded. Processor P1 no longer works.
Correction : a) Watchdog (machine parameter P6) set too accurately.
⇒Increase value of P6 (only after consulting with BOSCH)
b) For CP/MEM–4: Clock starting time (p5) too small (clock overflow).
c) Hardware of the CP card is defective.

3750 = System error 167 : NVI with error

PHG display :
Cause :
Correction :

3751 = System error 168 : P2 clock overflow

PHG display :
Cause :
Correction :

Group 14 : System errors

3752 = System error 169 : Incorrect loop mode

PHG display :
Cause :
Correction :

3753 = System error 170 : Belt synchronization traverse range limit

PHG display :
Cause :
Correction :

3754 = System error 171 : Currently not used

PHG display :
Cause :
Correction :

3755 = System error 172 : Currently not used

PHG display :
Cause :
Correction :

3756 = System error 173 : Currently not used

PHG display :
Cause :
Correction :

3757 = System error 174 : Currently not used

PHG display :
Cause :
Correction :

3758 = System error 175 : Currently not used

PHG display :
Cause :
Correction :

3759 = System error 176 : Currently not used

PHG display :
Cause :
Correction :

3760 = System error 177 : Currently not used

PHG display :
Cause :
Correction :

Group 14 : System errors

3761 = System error 178 : Currently not used

PHG display :
Cause :
Correction :

3762 = System error 179 : Currently not used

PHG display :
Cause :
Correction :

3763 = System error 180 : Currently not used

PHG display :
Cause :
Correction :

3764 = System error 181 : Axis processor stationary

PHG display : 'Axis proc. stopped'
Cause : Watchdog between P2 processor and axis processor has responded. Axis processor no longer works.
Correction : a) Clock starting time (p5) too small (clock overflow).
b) Axis clock time (yielded from the quotient P2 clock time/scaler) is too small. Only after consulting with BOSCH: Reduce scaler in machine parameter P5.
c) Hardware of the AP card is defective.

3765—3783 = Currently not used

PHG display :
Cause :
Correction :

3784 = System error 201 : Task management: P–TCB DELETE

PHG display : 'TSK–MN: P–TCB DELETE'
Cause : Error while deleting the Task control block of a user process which has been stopped.
Correction :

3785 = System error 202 : Task management: O–TCB DELETE

PHG display : 'TSK–MN: O–TCB DELETE'
Cause : Error while deleting the Task control block of a user output process which has been stopped.
Correction :

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3786 = System error 203 : Task management: R–TCB DELETE

PHG display : 'TSK–MN: R–TCB DELETE'
Cause : Error while deleting the Task control block of a user process which stops itself (RUNNING).
Correction :

3787 = System error 204 : Task management: SUSPEND process

PHG display : 'TSK–MN: Proc. SUSPEND'
Cause : Error during a SUSPEND operation of a user process which had a runtime error.
Correction :

3788 = System error 205 : Task management: SUSPEND user process

PHG display : 'TSK–MN: O–Pr. SUSPEND'
Cause : Error during a SUSPEND operation of a user output process after a runtime error occurred.
Correction :

3789 = System error 206 : Task management: P–PROC START

PHG display : 'TSK–MN: P–PROC–START'
Cause : Error during the initialization of a user process.
Correction :

3790 = System error 207 : Currently not used

PHG display :
Cause :
Correction :

3791 = System error 208 : Task management: P–TCB REQUEST

PHG display : 'TSK–MN: P–TCB–REQ.'
Cause : Error while activating a user process.
Correction :

3792 = System error 209 : Task management: O–PROC START

PHG display : 'TSK–MN: O–PROC–START'
Cause : Error during the initialization of a user output process.
Correction :

3793 = System error 210 : Task management: O–TCB CREATE

PHG display : 'TSK–MN: O–TCB–CREATE'
Cause : Error while creating the Task control block of a user output process.
Correction :

Group 14 : System errors

3794 = System error 211 : Task management: Call TCB REQUEST

PHG display : 'TSK–MN: O–TCB–REQ.'
Cause : Error while activating a user output process.
Correction :

3795 = System error 212 : Task management: PARALLEL_END

PHG display : 'TSK–MN: PARALLEL_END'
Cause : Sub-prozess counter for PARALLEL_ENDE not equal to zero.
Correction :

2796—3803 = Currently not used

PHG display :
Cause :
Correction :

3804 = System error 221 : Semaphore setting : I/O devices

PHG display :
Cause :
Note :

3805 = System error 222 : Semaphore resetting : I/O devices

PHG display :
Cause :
Note :

3806 = System error 223 :

PHG display :
Cause :
Note :

3807 = System error 224 :

PHG display :
Cause :
Note :

3808 = System error 225 : File management error

PHG display :
Cause :
Note :

3809 = System error 226 : File management for file I/O

PHG display :
Cause :
Note :

Group 14 : System errors

3810 = System error 227 : File management in organ. section

PHG display : 'fm–err. in org.–part'
Cause : File management error in the organization section. Error is recognized during run-up (CHECK_USMEM).
User memory is reorganized; all data are lost.
Note :

3811 = System error 228 : File management for file linkage

PHG display : 'fm–err.in file–chain'
Cause : File management error in the organization section. Error is recognized during runup, reset.
User memory is reorganized; all data are lost.
Note :

3812 = System error 229 : Currently not used

PHG display :
Cause :
Note :

3813 = System error 230 : Closed files accessed

PHG display : 'read–acc.closed file'
Cause : Read or write access operation on closed file.
Note :

3814 = System error : Illegal file write mode

PHG display : 'inadm.file–writ.mode'
Cause : Write access operation with illegal destination address (file end):
Note :

3815 = System error 232 : Illegal file destination address during write operation

PHG display : 'inad.file–adr. writ.'
Cause : Write access operation with incorrect destination address. Destination address of a larger file.
Note :

3816 = System error 233 : Overwrite after file end

PHG display : 'inad.ov.writ.aft.EOF'
Cause : File end exceeded!
Note :

3817 = System error 234 : Incorrect block free recognition

PHG display :
Cause :
Note :

Group 14 : System errors

3818 = System error 235 : Illegal File read mode

PHG display : 'inad.file–read.–mode'
Cause : Incorrect mode while reading data.
Note :

3819 = System error 236 : Illegal File open mode

PHG display : 'inad.file–open–mode'
Cause : Incorrect mode while reading data.
Note :

3820 = System error 237 : Allocated length = 0

PHG display : 'Alloc–length = 0'
Cause : File length equals zero.
Note :

3821 = System error 238 : Incorrect Open mode for allocation.

PHG display : 'incorr. OM of ALLOC'
Cause : Incorrect Open mode for allocation.
Note :

3822 = System error 239 : Undefined OPEN mode

PHG display : 'undefined open–mode'
Cause : Undefined OPEN mode
Note :

3823 = System error 240 : Incorrect control mode for DIR

PHG display : 'incorr. CM of DIR'
Cause : Incorrect control mode for list
Note :

3824 = System error 241 : Incorrect command mode F_CLOSE

PHG display : 'incorr.CM close–file'
Cause : Incorrect CLOSE mode.
Note :

3825 = System error 242 : Currently not used

PHG display :
Cause :
Note :

3826 = System error 243 : Currently not used

PHG display :
Cause :
Note :

Group 14 : System errors

3827 = System error 244 : File management after compress

PHG display :
Cause : File chain not sequential. Error is recognized during run–up (CHECK_USMEM). User memory is reorganized; all data are lost.
Note :

3828 = System error 245 : Currently not used

PHG display :
Cause :
Note :

3829 = System error 788 : ORG_START <> MEM_BEGIN

PHG display : ORG_START <> MEM_BEGIN
Cause : File management error in the organization section. Error is recognized during run-up (CHECK_USMEM). User memory is reorganized; all data are lost.
Note :

3830 = Currently not used

PHG display :
Cause :
Note :

3831 = System error 793 : File not sequential.

PHG display : 'FILE NOT SEQUENTIAL'
Cause : File management error in the organization section. Error is recognized during run-up (CHECK_USMEM). User memory is reorganized; all data are lost.
Note :

3832 = Currently not used

PHG display :
Cause :
Note :

3833 = System error 879 : EEPROM verify not OK

PHG display :
Cause :
Note :

3834 = Currently not used

PHG display :
Cause :
Note :

Group 14 : System errors

3835 = System error 993 : Currently not used

PHG display :
Cause :
Note :

3836 = Currently not used

PHG display :
Cause :
Note :

3837 = System error 1110 : Teach IN: Error in the PKT–file.

PHG display :
Cause :
Note :

3838 = Currently not used

PHG display :
Cause :
Note :

3839 = System error 2223 : EEPROM faulty

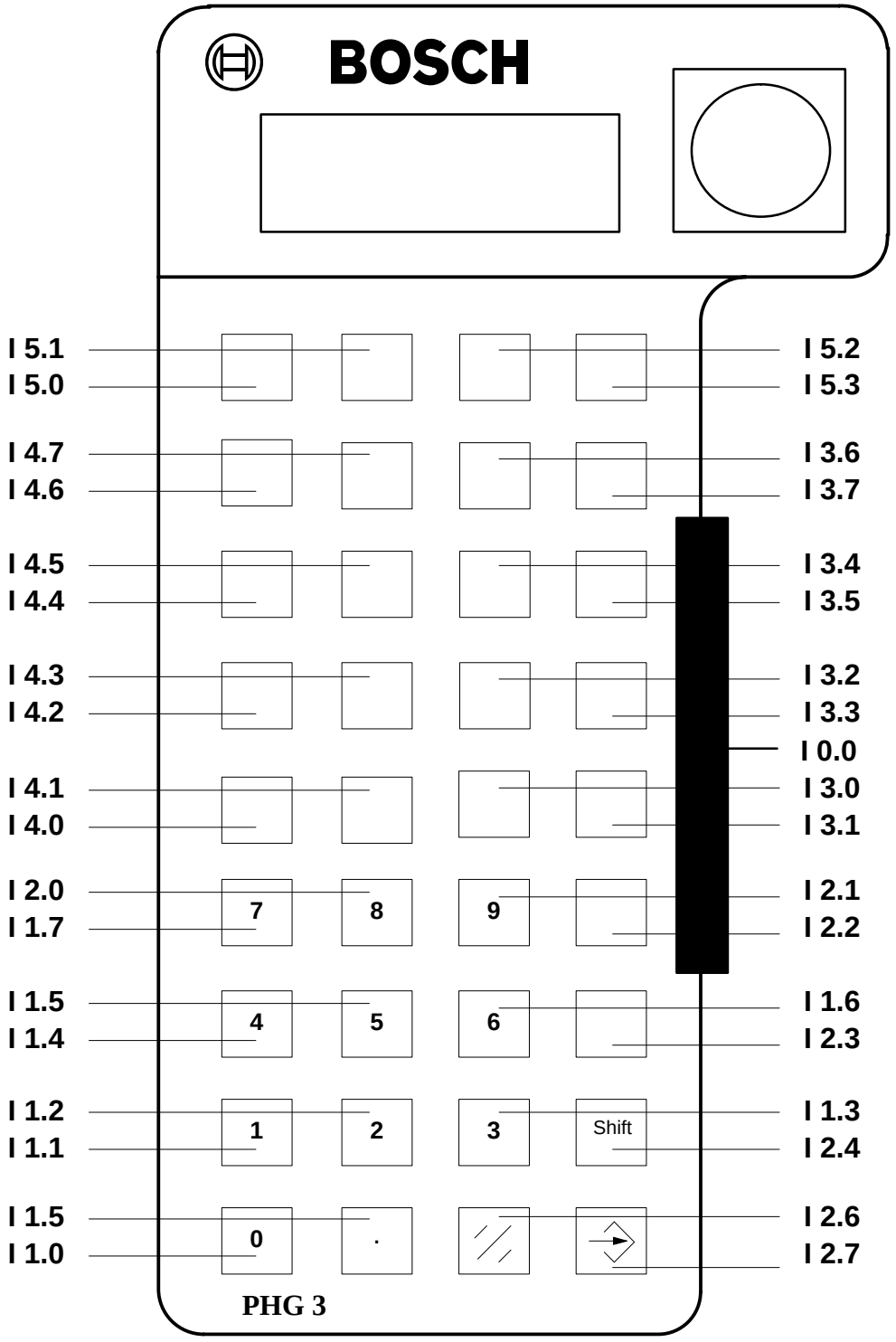
PHG display :
Cause :
Note :

9.10 Group 15 : System errors (Reserved)

3840 — 4095 = Currently not used

PHG display :
Cause :
Note :

10. PHG3 key assignment



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