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Internal

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Subject: **PCD4.M1x5**	FW VERSION **V0F1**	

Doc #:   **D4M1x5_0F1.doc**

PCD4M1X5 SUMMARY OF FIRMWARE VERSIONS

This summary presents a short description of all firmware versions used with the PCD4M1x5 in production (official versions and exceptionally some intermediate $ versions).

Concerning corrected / known bugs:
Only important bugs are listed here. For other bugs, please refer to the file COMSWER.XLS that contains more information about known bugs.

FEATURES OR RESTRICTIONS SPECIFIC TO PCD4.M1X5

General
- The PCD4.M1x5 is the new CPU for PCD4 and will replace the PCD4.M1x0. The functionality is identical but this new CPU is about 30% faster as the old one.

Memory
- User memory:

User prg mem.	HW	System Memory	FW	Default Memory configuration
R110 / R2x0 RAM (/EPROM)				
2*256kbits		64kBytes		7k prg lines, 4k txt
2*512kbits		128kBytes		7k prg lines, 4k txt
2*1Mbits	≥E	256kBytes		7k prg lines, 4k txt
R310 RAM (/EPROM)				
2*256kbits		64+172kBytes	0B0	7k prg lines, 4k txt
2*512kbits		128+172kBytes	0B0	7k prg lines, 4k txt
2*1Mbits		256+172kBytes	0B0	7k prg lines, 4k txt

- EEPROM: Not present on PCD4

Instructions
- SYSRD/SYSWR
  - SYSRD/SYSWR/SYSCMP/DEFTR instructions.   V00C
  - SYSWR 1000: System watchdog   not implemented
  - SYSRD/SYSWR 7050 to 7081   V0E0
    to read and write the different elements of the clock.

- SYSRD 7090, coordinated universal time.   V0E0
    Function that returns the number of seconds elapsed since 00:00:00;
    January 1; 1970 (), according to the system clock.
- PID
    - Instruction has been corrected.   V00C
    - Added a SYSWR K 998 to select the old PID algorithm.   V00D
- SASI
- Text accepts $R parameters.   V0E0
    E.g:"UART:$Ra,$Rb,$Rc,$Rd;MODE:$Re,$Rf;DIAG:FRg,RRh;"

a	Baudrate	110…38400 (numerical value)
b	Bits	7,8 (numerical value)
c	Parity	E,O,N (ASCII coded)
d	Stop	1 or 2 (numerical value)
e	Mode	'MC0', 'SM2', etc. (ASCII coded)
f	Station	Reg. with S-Bus station (numerical value)
g	Diagnostic flags	Reg. with the base diag. flag nbr (0..8191 num. value)
h	Diagnostic register	Reg. with the diag. register nbr (0..4095 num. value)

Communication

- Serial communication:
    - MD/SD, MM4, MC0/1/2,4:   V00B
    - MC5: Character mode for RS-485 that deactivates drivers directly after
      completion of transmission.   V0F0
- S-Bus:
    - Parity and break modes as master and slave.   V00B
    - Data-Mode   V00D
    - Modem+   V00B
    - Gateway (GM/GS).   V00C
- S-RIO as master and slave.   V00D
    The S-RIO master task assumes the communication and the refresh of the
    process image. The RIO task is activated by a SASI instruction. The SAIA
    configurator automatically generates the SASI text, the configuration and
    messages DB. For more information please read the document "Remote I/O with
    SAIA S-Bus" 26/751 F2.
- PROFIBUS FMS: see PCD4.M445
- PROFIBUS DP: not implemented
- LON: not implemented
- LAN2:   not implemented

- Up to 2 ports could be configured/assigned at 38.4 kBds at the same time. V0F0

Miscellaneous

- New features for PG5.   V0E0
    - New OUTL and OUTLX instructions
    - New synchronization for a bloc downloads in mode "RUN"
    - Possibility to upload data (SEDIT and SFUP) in a synchronized manner.
- XOB
    - XOB 20, 25: interrupt inputs XOB's   not implemented
    - XOB 17, 18, 19: User XOB's   V00B

This XOB's which can be provoked via S-BUS telegram (STXM chan, 0, k 4000, k 17..19) or SYSWR command (K4017..K4018). The XOB's are only executed if the CPU is in RUN or CONDITIONAL RUN.

- XOB 7: System overload XOB   V00C
- XOB 14/15: Cyclic XOB's
  can be executed from 10 ms to 1000s with 10 ms steps   V00C
  can be executed from 5 ms to 1000s with 1ms steps   V0E0
- New XOB handling.   V0E0
  During the execution of a XOB other XOBs are queued and executed at the end of the first one.

- Calculation of week and day number   V00D
  The PCD compute the day and the week number based on the date using the same algorithm as in the PG. The command 'Write Clock' corrects automatically the week number or day number if they are wrong.
- Password mechanism.   V00B

0F1

Major corrections
- At startup a bus quit failure (or other strange behaviors) can occurred after the exchange of the memory pack.

Modifications realized - by SWERs number

1380 – 19.02.2004
At startup a bus quit failure (or other strange behaviors) can occurred after the exchange of the memory pack.

1373 – 21.01.2004
Especially with external interrupts (e.g. XOB 20/25), in some circumstances the system indicates a system overload (XOB 7) even if this is not the case.

1372 – 15.01.2004
Some SYSWR instructions (7000, 7001, 7050…) expect a register as 2nd parameter. If this parameter is a constant (K) various failures are possible, for example:
- Program stops, RUN LED remain turned on.
- Communication is lost.
- A valid result is not available (no register for the return value).

1350 – 26.09.03
The master SRIO task does not work with baudrates other than 38.4 and 76.8 kBauds.

1343 – 18.06.2003
If an S-Bus (DATA mode) response telegram is corrupted that the last byte is equate to C5 then a retry is done but the answer will not be correctly interpreted. (B5 will be put in the msB of the answer).

1341 – 12.06.2003
1) After execution of instruction TEST 20 (serial channels) the gateway (configuration) doesn't work until a restart cold.
2) The PCD goes off line if TEST 20 is executed continously.
To reproduce this bug: configure SBUS at 38400baud on port 0 or 1 and after a few secondes the system goes to off line.

Information for PROM programming.

Hex file	Checksum	EPROM Label	EPROM type / art n°
D4M1x5_0F1_1.hex	4AE1	PCD4.Mxx5 V0F1/1	27C1001-10 ---
D4M1x5_0F1_2.hex	B3E4	PCD4.Mxx5 V0F1/2	4 502 7126 0

0F0

Major corrections

- The serial communication, especially at 19.2 or 38.4 kBauds, sometimes blocks (SWER 1288).
- If an error occurred in the XOB13 then the XOB was executed until its end and then restarted immediately, causing an endless loop if the error is still present (SWER 1181).
- Some corrections were done in relation with the download in RUN and the synchronous dataview (SWERs 1174, 1172, 1170, 1160, 1159).
- MC mode
No more character will be lost during SASI off if TBSY is low.
By sending character check TFUL (and not TBSY) in order to not have a delay between each character (SWER 1235).

Modifications realized - by SWERs number

1324 – 23.03.2003
In the case of a CPU-crash the stack will be copied to get more informations about the crash.

1312 – 29.11.2002
A "bus quit failure" occurs if in the TFRI instruction the source or destination register / timer / counter) is negative. Eg. TFRI DB DB_pnt, R R_pos, R R_Dst_pnt with R_Dst_pnt = -1.

1311 – 22.11.2002
A SASI GM on port 0 or 1 can cause any kind of problems. Known effects are:
- CPU crash
- Loss of S-Bus communication on port 2 or 3.

1308 – 29.10.2002
Graftec : Download block on run is not possible if COB 15 is used (COB 15 is running). A Message Box appears : Timed out waiting for blocks to be switched.

1274 – 15.05.2002
The command "Display CPU-Status" in the SAIA debugger returns only 1 line of information (CPU number, platform and FW version) over Master Gateway. The PRODUCTION INFORMATION (System ID, Hardware Version, Modifications, Fab. Date) is not returned.

1248 – 13.02.2002
It is possible to configure/assign the 2 ports of a DUART at 38.4 kBds but the number of ports at 38.4 kBds are limited to number of ports for the system divided by 2.

1235 – 14.01.2002
In MC mode, the tbsy (or xbsy) flag is reset during the transmission of the 2 last characters, therefore these characters could be lost during a SASI OFF.

!!! Now tbsy is reset at the end of transmission. This could result in a delay (at 9600 baud ,8bits,N,1stop : 2ms) between each character if communication is controlled with tbsy instead of tful.

1233 – 20.12.2001
After a restart on a password protected PCD, the PCD goes into reduced protocol after about from 5 to 10 minutes, and the password has to be entered again.

1222 – 27.11.2001
Download of a LON project over Gateway by using PG4 Version 2.0.210 is not executed.

1214 – 10.10.2001
The last character of the module type (e.g. PCD2.M15¢ or PCD2.M15`) is sometimes incorrect in the PG. PG displays six characters but only five characters are initialised in the PCD.

1212 – 01.10.2001
A Program that has more ST/TR than allowed in a system results in unpredictable problems.
The PG limited this to 2000 until now. However this has now been changed (PCS1.C8 max. 200 ST/TR, M170 max. 6000 ST/TR).

1182 – 11.05.2001
Using the LDX instruction to set timer/counter causes a bus quit failure when the sum of the index register and the number of the timer/counter is bigger than 8191.

1181 – 10.05.2001
If an error occurred in the XOB13, then it was executed until its end and then restarted immediately, causing an endless loop (if the error was still present).

1178 – 09.04.2001
In multi CPU PCD, using TEST 2 on one CPU can cause a bus-quit failure on the other CPU.

1174 – 05.03.2001
Download block in run from PG5 downloader doesn't work correctly.
a) After download block in run, the PCD returns an error message to the PG. The telegram from the PG is correct.
b) The "download block in run" deletes blocks which are not used anymore. If the address of the block to be changed equals 0, the corresponding pointer in the block table is not cleared immediately.

1172 – 28.02.2001
In PG5 synchronous dataview (Saia IL Editor) the ACU information is not correct. In fact it is the actual ACU (ACTA) and not the OR combination between actual ACU (ACTA) and OR ACU (ORA).

1170 – 23.02.2001
A download of a block while the PCD is running causes a timeout error in PG5 before the timeout has exceeded.

1066 – 20.11.1998
MC4 mode does not deactivate RS-485 drivers directly after completion of transmission (like PCD4.MXX5 v$c4). Added new mode MC5.

Hex file	Checksum	EPROM Label	EPROM type / art n°
D4M1x5_0F0_1.hex	35AE	PCD4.Mxx5 V0F0/1	27C1001-10 ---
D4M1x5_0F0_2.hex	D69F	PCD4.Mxx5 V0F0/2	4 502 7126 0

0E1

Major corrections

- Corrected the COB supervision time. In a program with only one COB, XOB 11 was called even if the supervision time wasn't exceeded (SWER 1151).

Modifications realized - by SWERs number

1160 – 26.01.2001
In the SAIA debugger, the command " File Load Cob" of an additional COB causes a CPU crash (68k invalid address, 68k invalid OPC,…), only with PGU S-Bus protocol.

1159 – 10.01.2001
In synchronous dataview (Saia IL Editor) if the program has a jump forward then the buffer was not filled with the correct datas. The jump command has no data but the line before the jump entry has some datas.

1152 – 28.09.2000
SYSRD K 5210 must return back 70h and not 0 for FW-Version 070.
A bug fix version must return a value too (#81 returns 81h).

1151 – 22.09.2000
XOB 11 is called, even if the COB supervision time has never exceeded. If the supervision time is 2s then the XOB 11 will be called every 2s. If there is one COB more (for example COB 1) then the XOB 11 will not be called anymore.

1148 – 21.08.2000
The instruction " DIAG " gives the wrong program line numbers of the block calls (Nesting level information) and entirely wrong informations when the error occurred within XOB 16.

1147 – 03.08.2000
Instructions MOV (with digit), DSP and WTIME change P/N status flags.
Instructions DIGO and DIGOR set the E and N status flags with negative values.

Information for PROM programming.

Hex file	Checksum	EPROM Label	EPROM type / art n°

D4M1x5_0E1_1.hex	B487	PCD4.Mxx5 V0E1/1	27C1001-10
D4M1x5_0E1_2.hex	55C3	PCD4.Mxx5 V0E1/2	--- 4 502 7126 0

0E0

Major corrections

- Test 400: The information of media corruption is now memorized until next TEST 400 and no more cleared by the start-up (SWER 1138).

Modifications realized - by SWERs number

1144
After a STH (or another bit instruction except ACC) a SOCL set the signal even if ACCU is low.

1138
The information of media corruption has to be memorised until next TEST 400 and not cleared by the start-up.

1135
In some cases, after a reset SB (RSB) in a parallel branch, the grafcet doesn't wait correctly the rendez-vous the next times this branch is executed.

1129
Tlg "write clock" on PCD4 with GWY sometimes blocks the CPU. LED RUN is ON but process is stopped and communication is not possible.

1125
Send the date to a display with STXT on XOB 16 gives: dd.mm.yy. (Mode MC1)

1118
A DBX bigger than 3 gives a "HALT EVERYTHING IS OK" message on start-up. The FW should ignore DBX bigger than dbxlimit.

1106
If SYSCMP is call after an OR or XOR sequence with the first conditions at true (ORA=1) then the result is always ACC high even if the time is elapsed.

1103
There is a memory corruption if you execute the command PUT/GET with a register into/from a DB in extension memory of 0 bytes (DB[0]).

1094
Telegrams from a S-BUS/PGU or GS port are sending without TS delay on a MG port.

1082
Trace mode in the PG4 Debugger provokes:
- some 68K ADDR ERR
- some strange steps (for example program line 12 to program line 65)

- same problem when asking GET STATUS: The line displayed at "stopped at" is sometimes completely out of range

The command 'Display Program (COB, XOB,...) Refresh' provokes the same error

1080

DB in extension memory defined with a size of 0 bytes provoked errors, when the program is in a FLASH or EPROM. The extension memory was not recreated after a BATTERY failure.

1074

The communication S-BUS via gateway master port 1 doesn't work if the user program is in the CPU 1

1072

When the data exchange between the master station and the RIO slave doesn't work, all registers containing analogue value are reset.

1059

New S-Bus telegrams cannot be accepted via gateway into slave PCD if these new functions are not implemented in the FW of the Gateway station.

Information for PROM programming.

Hex file	Checksum	EPROM Label	EPROM type / art n°
D4M1x5_0E0_1.hex	8DBC	PCD4.Mxx5 V0E0/1	27C1001-10 ---
D4M1x5_0E0_2.hex	58C8	PCD4.Mxx5 V0E0/2	4 502 7126 0

00D

Major corrections

- Many corrections were made on S-Bus and especially on gateway (SWERs 1070, 1067, 1053).

Modifications realized - by SWERs number

1070

Assignation of an SBPGU and a MGWY give no errors back if the baudrates are not compatible (38.4kBds/38.4kBds, 38.4/19.2, …) on the port 0/1 (respectively 2/3).

1067

GWY System with an S-Bus communication from the master to the slaves: Not possible to make an S-Bus connection whit the debugger from external master to a Slave, if one Slave is not connected to the network.

1054

GWY System with Broadcast message on the GWY Master port and on the GS Port: After an irregular time the PCD goes in halt and the run and error led blinks.

1050

The S-Bus communication don't work correctly if in a GWY system a BITO instruction is performed before the SASI instruction (The output of the BITO instruction are the diag-flag from the SASI instruction)

1031

The instruction WTIME doesn't accept bad entries for the day number and week number. If so, then the PCD sets the Error Flag and does not update the time.

1021

If an S-BUS telegram provoked a bus error (with display/write byte or erase flash) the PCD stay in an end less loop.

Information for PROM programming.			
Hex file	**Checksum**	**EPROM Label**	**EPROM type / art n°**
D4M1x5_00D_1.hex	CE3C	PCD4.Mxx5 V00D/1	27C1001-10 ---
D4M1x5_00D_2.hex	D33E	PCD4.Mxx5 V00D/2	4 502 7126 0

00C

Major corrections

- There have been some very large modifications made to the kernel of the system to reorganize the treatment of the communications, the decrementation of the timers and the update of the real time clock (all tasks which take a long time). This was necessary because of a number of SWERS illustrating bad quality of communication with retries on all systems. This has meant major modifications to the kernel structure which are now common to all systems.
- File load modifications has been implemented under S-Bus only. It is now possible to choose whether to clear the outputs during the download or to make a RUN command directly after the download.

Modifications realized

- Problems with the PID instruction.
- SCOB instruction doesn't work correctly.
- When in trace in GRAFTEC, if a condition is TRUE in the Transition then the transition is active, but the next step has already been executed.
- The error flag problem with the SASI instruction, this includes the whole concept of the error flag.
- Problem with MD/SD mode when transmitting the RTC.
- The break length definition doesn't work correctly with SM0 Mode

Information for PROM programming.			
Hex file	**Checksum**	**EPROM Label**	**EPROM type / art n°**

Hex file	Checksum	EPROM Label	EPROM type / art n°
D4M1x5_00C_1.hex	EEED	PCD4.Mxx5 V00C/1	27C1001-10 --- 4 502 7126 0
D4M1x5_00C_2.hex	0CF1	PCD4.Mxx5 V00C/2	

00B

This is the first official version for PCD4.M1x5 (fast CPU0 with MC68340 / 16MHz). It is identical to V005 of the PCD4Mxx0.
The PCD4.M1x5 is about 30% faster as a PCD4.M1x0.

Information for PROM programming.

Hex file	Checksum	EPROM Label	EPROM type / art n°
D4M1x5_00B_1.hex	4B82	PCD4.Mxx5 V00B/1	27C1001-10 --- 4 502 7126 0
D4M1x5_00B_2.hex	2AA7	PCD4.Mxx5 V00B/2	