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Subject: PCD1M1x5	FW VERSION <u>V0F1</u>	
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PCD1M1X5 SUMMARY OF FIRMWARE VERSIONS

This document summarizes the changes of all firmware versions that are liberated on the PCD1M1x5 for production.

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 PCD1M1X5

General

- **FW update:**
The FW can be updated with the FW downloader. To start this program click "PCD FW downloader" in the "tools" menu from the PG5 Saia Project Manager.
The FW update can only be done through the PGU port (port 0).
- **CPLD programming:**
At first power up after a firmware update the CPLD will be reprogrammed if its version is different.
Do not interrupt this programming sequence which take about 30 seconds, but in some case it can take until 2 min. (LED's are all off while programming, and blinking in the normal start-up sequence when finished)
At power line cuts during CPLD programming the PCD may have to be returned to SBC.

FW Version history ↔ CPLD Version

FW Version	0A0...
CPLD Version	m1da

Memory

- User memory:

User program memory	HW	System Memory	Default Memory configuration
None		128 / 0 kByte	24k prg lines, 32k txt/db
RAM / EPROM			
	1 Mbits	128 / 128 kByte	24k prg lines, 32k txt/db, 128k extended txt/db
	4 Mbits	512 / 128 kByte	96k prg lines, 128k txt/d, 128k extended txt/db
FLASH			
	1 Mbits	112 / 128 kByte	21k prg lines, 28k txt/db, 128k extended txt/db
	4 Mbits	448 / 128 kByte	84k prg lines, 112k txt, 128k extended txt/db

Note:

- At first memory configuration the FW makes an allocation with the maximum space available depending on the RAM/EPROM/FLASH chip.
 - Extended txt/db (txd/db number \geq 4000) use fast indexed access and support binary zero insertion, lower range txt/db have a slower access and do not support binary zero insertion.
 - There is no extended txt/db if no optional memory chip is added.
 - With EPROM and FLASH as user program memory the txt/db $<$ 4000 are read only. With RAM the txt/db $<$ 4000 can be set to read only using the WP on board jumper.
 - The setting of bindings in LON (LON commissions) is only possible if RAM is used and the read protection jumper is not set.
- EEPROM:
 - The S-Bus configuration is automatically saved in the EEPROM, this means that even if the battery becomes discharged the S-Bus configuration will be safe.
 - There are 50 non-volatile user registers.

Instructions

- NOP
 - Instruction set to ~5µs for FB's compatibility V0A0
- LD=/LDX=
 - FB's parameters can be use on the LD and LDX instructions. V0B0
- SASI
 - Text accepts \$R parameters. V0A0
E.g: "UART:\$Ra,\$Rb,\$Rc,\$Rd;MODE:\$Re,\$Rf;DIAG:F\$Rg,R\$Rh;"
 - 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)
- SYSRD/SYSWR
 - SYSRD/SYSWR/SYSCMP/DEFTR instructions. V0A0
 - SYSWR 1000: System watchdog V0A0
 - SYSRD 660x for serial port mode read back added V0A0
 - SYSRD/SYSWR 7050 to 7081 V0A0
 - to read and write the different elements of the clock.
 - SYSRD 7090 V0A0
 - Function that returns the number of seconds elapsed since 00:00:00;
January 1; 1970 (coordinated universal time), according to the system clock.
- SF
 - IP library V0A0
 - Added SF "ReadIPConfig" V0B0
 - Application library V0A0
 - including SFs "CopyText", "InitDB", "CopyDB2Registers", "CopyRegisters"
 - New "CopyBytes" SF V0F0

Communication

- Serial communication:
 - MC0/1/2/4, MD/SD, MM4 V0A0
 - MC5 mode that deactivate RS-485 drivers directly after completion of transmission. V0A0
 - Freeze function for the MC mode to ensure that no inter-character delay take place during the transmission of a frame. V0F0
- S-Bus:
 - Parity and break modes as master and slave. V0A0
 - Data-Mode and secure data mode V0A0
 - Option to disable the S-Bus secure data mode V0F0
 - Modem+ V0A0
 - Gateway (GM/GS). V0A0
 - S-Bus Secure data mode. V0B0

- S-RIO as master and slave. V0A0
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 with PCD7.F700:
 - Base functionality V0A0
10 channels (10...19) and 100 objects (100...199).
 - Extension (at least SPROF \$137 is needed) V0A0
possibility to map objects on DBs, read/write indicator, multicast/broadcast link, watchdog.
 - Extension for profile GA V0A0
- PROFIBUS DP: V0A0
 - Master mode with PCD7.F750.
 - Slave mode with PCD7.F77x.
 - Introduced signed values V0B0
- LON with PCD7.F80x:
 - Base functionality V0A0
 - LON enhancement with new functionality poll and alias (LON 1.5). V0A0
- Communication on TCP_IP with PCD7.F650/F652: V0B0
 - S-Bus over UDP/IP
 - SMTP E-Mail support
 - DHCP / UDP with the PCD7.F655
- WEB server V0A0
 - S-Web Alarming V0B0
- PGU switches automatically to 38.4 kBds (requires PG5 V1.2). V0A0
- 1 port could be configured/assigned at 38.4 kBds. V0A0
- It is possible to configure/assign port 0 (or 1) at 38.4 kBds and port 1 (or 0) at 19.2 kBds. V0A0

Miscellaneous

- New features for PG5. V0A0
 - 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 V0A0
 - XOB 17, 18, 19: User XOB's V0A0
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 V0A0
 - XOB 14/15: Cyclic XOB's V0A0
can be executed from 5 ms to 1000s with 1ms steps

- New XOB handling. V0A0
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 V0A0
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. V0A0

V0F1

Major corrections and changes

- IP communication doesn't work anymore.

Modifications realized by SWER number

1553

IP: IP communication doesn't work anymore.

Information for FW update.

FW update file	Checksum	Label
PCD1M1X5_0F1.blk	---	D1.M1x5 ex work: - BOOTER V0A4 - FW V0F1

V0F0

Major corrections and changes

- New option to deactivate the S-Bus secure data mode.
- Freeze function for the MC mode to ensure that no inter-character delay takes place during the transmission of a frame.

Modifications realized by SWER number

1551

WEB: In a specific Web application "WEB stack overflow" occurs (KR-PC-09-034). Web stack size is now about twice as big.

1549

Flash: New 1MB Macronix A29800B FLASH type as FW memory.

1548

Interpreter: If the INI/DEI operand is outside the valid range, the index register is not incremented/decremented and the ACC is set. This can result in an endless loop. ACC has to be reset in this case.

Example: INI R xxxx [>8191]
 JR H -1

1547

Serial communication: Introduce a new option to deactivate the S-Bus secure data mode.

1546

Interpreter: Get instruction doesn't work when the source is a text and the destination is the last register (R 4095).

1545

Interpreter: Add a new SF to transfer byte between Register, DBs or Texts (the number of DB and Texts has to be bigger than 4000).

1544

Serial communication: In an S-Bus data mode request telegram, special characters (=>B5 and C5) in the "secure" header are not replaced by the DLE sequence. This result that on 2 / 255 telegrams no response is send back + some specific telegrams with length B5 or C5.

1543

Crash: The PLC crashes (bus error) when a user attempts to read 255 elements from DB over S-Bus.

Note: Rcount is now limited to 0x64.

1533

Serial communication: New freeze function to ensure that no inter-character delay takes place during the transmission of a frame using STXD instructions in MC mode. The transmission of characters is stopped if the freeze flag (optional parameter in the mode definition) is set and restarted once it is reset.
Eg: UART:115200,8,N,1;MODE:MC0,Fnn;DIAG:Fnn,R10;TBUF:512"

Information for FW update.

FW update file	Checksum	Label
PCD1M1X5_0F0.blk	---	D1.M1x5 ex work: - BOOTER V0A4 - FW V0F0

V0E6

Major corrections and changes

- Write text not possible through the Web interface
- Corrections on the RTC

Modifications realized by SWER number

1542

WEB: The PLC crashes (68k address error) when a user attempts to write a text >= 4000 from the WEB interface.

1538

Serial communication: Exceptionally, on some CPU, it happens, on a channel assigned in MC mode, that characters are not sent. This occurs if an internal variable is no more correctly initialised after a RAM lost (eg. After deficient battery).

1536

Interpreter: Some SFs don't clear the error flag if executed successfully.

1535

Clock: After a write clock it happens that the PCD time stay stuck. A new write clock command will unblock the time.

1534

Clock: Sometimes the RTC miss 1 second.

Example: if T1 = 10:30:10, 250ms later the new time is T2 = 10:30:12 instead of 10:30:11.

Information for FW update.

FW update file	Checksum	Label
PCD1M1X5_0E6.blk	---	D1.M1x5 ex work: - BOOTER V0A3 - FW V0E6

V0B3/V0E3

Major corrections and changes

- Web server improvement
- Modem communication doesn't work if Profibus DP is also in use

Modifications realized by SWER number

1532

Clock: After a RTC update sometimes the PCD time is updated only after 2 seconds.

1531

MODEM: DTR signal on port 1 doesn't work any more when the port 9 is configured as DP.

1530

WEB: Sometimes it's impossible for the browser to continue to load the pages because the web server is blocked, the response is always "NR"(not ready).

1529

WEB: At first Web server access after a PLC restart (or Web reset) the Web server keeps the hand much longer than specified in the configuration (20..300ms depending of the RAM disk size and the system).

Information for FW update.

FW update file	Checksum	Label
PCD1M1X5_0E3.blk	---	D1.M1x5 ex work: - BOOTER V0A3 - FW V0E3

V0B1

Major corrections and changes

- Web server improvement

Modifications realized by SWER number

1528

WEB: An "active and non ack" display filter is wanted for the alarming.

1527

DP communication: Allow to reassign the DP slave in order to reset and reinitialise the module.

1526

WEB: On the default WEB pages the new SAIA logo should be displayed (Control Systems and Components and no more Smart solutions for comfort and safety).

1524

CSF: In the application library the SFs ClearMem/ReadMem/WriteMem crash if the parameter is a DB instead of a Register.

1517

Graftec: System crashes if going step by step with Graftec editor when no CSB is used in the user program.

The bug occurs with PG5 SP1.4.130 but not with PG5 1.3

1495

Web: Text PPOs are limited to 32 characters, 64 required.

Information for FW update.		
FW update file	Checksum	Label
PCD1M1X5_0B1.blk	---	D1.M1x5 ex work: - BOOTER V0A3 - FW V0B1

VOB0**Major corrections and changes**

- Alarming has been added
- S-Bus secure data mode has been added
- Profibus-DP supports now signed value
- Improvement of the PCD immunity against bus error
- Ethernet broadcast telegrams salvo could block the IP communication

Modifications realized by SWER number**1523**

CSF: If the CSF function doesn't exist then the system crashes (e.g.: IP library, function IPSend).

1522

CSF: Add a CSF (19) into IP library to read IP configuration (IP address, Subnet Mask and Default Gateway).

1518

Serial communication: S-BUS PGU is no more reassigned when the timing interval between SASI off on assigned port and the SASI off on S-BUS PGU port is smaller than 1second.

1515

IP communication: IP communication is blocked when the server is bombarded by the clients. Especially with broadcast telegrams.

Note: this bug only occurs on the IP module F655 but not on F650.

The F655 "forgets" to generate again the interrupt when the new message is not got out of the mailbox by the PCD.

1509

Interpreter / SF: In the SF Copy text by interpreting a \$F or a \$I bit 7 was always 0 (not read).

1508

Web server: In CGI Alarming, delete sorted by Type is wanted.

1505

Interpreter: At the CSF Copy text function (CSF 6, 0), source and destination Txt/DB register indirect addressing is wanted.

1503

System: No more possible to go on line with PGU on a PCD without IP-Module but with an IP-configuration when the RAM is lost (bad battery).

1499

System: If a crash occurs in the XOB 0, the CPU goes in HALT even if the SW_Wachtdog is active.

1498

Interpreter / Web: Alarming has been added.

1497

S-Bus: S-Bus Secure data mode has been added.

1496

Profibus DP: Supports now signed value transfer on Profibus-DP protocol

1491

System: At bus error a retry is wanted before getting in halt.

1492

Interpreter: CSF [6, 0] (copy text) doesn't work correctly when the included text is empty. The converted text contains other characters.

Information for FW Flash programming.		
FW-file	Checksum	Label
PCD1M1x5_0B0.blk	---	PCD1.M1x5 BOOTER V0A3 FW V0B0

V0A7

Modifications realized by SWER number

1490

Interpreter: At the use of 4 MB RAM around code line 32620 the user program got overwritten.

1489

Interpreter: Access to text/DB with number $\geq 32\ 768$ are not check correctly and in few case this could crash the CPU. Normal text/DB range is 0..5999/6999/7999 and such accesses never occur with SAIA tools but are possible with specific applications (e.g. a supervision system).

Information for FW Flash programming.

FW-file	Checksum	Label
PCD1M1x5_0A7.blk	---	PCD1.M1x5 BOOTER V0A3 FW V0A7

V0A6

Modifications realized by SWER number

1485

Web: Not all HTML form values are written to the PLC media.

1468

In S-BUS UDP, the instruction SRXM doesn't work if using the special function codes K 2000, K 3000 and K 6000.

Information for FW Flash programming.

FW-file	Checksum	Label
PCD1M1x5_0A6.blk	---	PCD1.M1x5 BOOTER V0A3 FW V0A6

V0A5

Major corrections and changes

- Booter version: In parallel with FW V0A5 a new booter version V0A3 is released. This booter corrects a problem with RTC corruption. The booter version can be verified using the online debugger and the Display bYte 800010 command.

Modifications realized by SWER number

1486

Booter: If the PCD is turned on for only a short time (about 200ms..1s) then the RTC is set back to the initial value 01.01.1990.

1484

LON: At LON alias use LON transmission is slow, blocking, or blocks the whole PCD.

1483

Web: Access to the default web pages some times cases a system crash.

1482

Amic flash chip wanted for user memory chip mounting.

1481

CSF: The CSF (convert text) doesn't work if an including text (\$L mechanism) is empty. The CSF stops converting and ignore the remaining text.

Information for FW Flash programming.

FW-file	Checksum	Label
PCD1M1x5_0A5.blk	---	D1.M1x5 ex work: - BOOTER V0A3 -FW V0A5

V0A3

Major corrections and changes

- **Booter version:** In parallel with FW V0A3 a new booter version V0A2 is released. This booter corrects a problem with register corruptions. The booter version can be verified using the online debugger and the Display bYte 800010 command.

Modifications realized by SWER number

1480

Booter: If the PCD is rapidly switched off and off repeatedly cleaned register got corrupted and did not start up with 0.In the booter stack overflow occurred.

1478

Modem: If using S-Bus communication on COM 2 /3 the modem connection on port 1 got lost. The DTR output signal got corrupted.

Information for FW Flash programming.

FW-file	Checksum	Label
PCD1M1x5_0A3.blk	---	D1.M1x5 ex work: - BOOTER V0A2 - FW V0A3

VOA2

Major corrections and changes

- LD= and LDX= added, and Graftec RSB accepts register now
- IP handling has been extended and corrected
- S-Bus has been extended and a S-Bus slave problem corrected
- The Web server has been extended and corrected

Modifications realized by SWER number

1477

Interpreter: In the CSF copy text (or STXT) if the source text contains one or more <0> (e.g. text 1: "Temp A: \$R0001 <0>; Temp B: \$R0002;") then only the text until the 1st <0> is processed.

1476

Interpreter: CSF copy text with count K 0 (parameter 3) sometimes causes a crash.

1475

Interpreter: A CSF function for production and fabrication information reading from EEPROM is wanted.

1474

Interpreter: New LD= and LDX= is wanted.

1473

Interpreter: Register indexed RSB for Graftec is wanted.

1472

IP communication: Implemented DHCP Client support with the PCD7.F655 Module.

1471

S-Bus: Multiple read and write medias (R,T,C,I,O,F) S-Bus telegrams are wanted, in "reduced" and broadcast mode not to be supported.

1469

Web Server didn't response anymore after some time (Either NAK or Content not ready is displayed in Web Connect).

1467

IP communication: Error when moving DBs with STXM and SRXM in S-BUS UDP.

1466

Ether-S-Bus: In S-BUS UDP, the STXM special function call with K 4000 did not work.

1464

S-Bus: If on an S-Bus slave ports two telegram are received directly one after another after the response of the first 3 or more byte junk data has been sent. The deactivation of the transmitter in polled mode directly after telegram finishing has been added and the "receive converter" has been deactivated. This works only if ONE telegram is sent during response sending.

1463

Web server: After downloading a new program, the web server got unreachable and the PCD had to be restarted. The RAMdisk access got corrupted by the reset.

1462

Web server: The web server got unreachable after a long time usage. The file handler on the RAM disk did not reset properly

1461

PCD start-up: A new start-up LED signalisation with detail information for production testing is wanted.

Information for FW Flash programming.		
FW-file	Checksum	Label
PCD1M1x5_0A2.blk	---	D1.M1x5 ex work: - BOOTER V0A0 - FW V0A2

V0A1**Major corrections and changes**

- At power down the RTC is set to default value: 01/01/1990 00h00m00s (SWER1457).

Modifications realized by SWER number**1458**

The read/write text S-Bus commands should also be supported in reduced mode.

1457

At power down the RTC is set to default value (01/01/1990 00h00m00s). This doesn't happen if the XOB0 is programmed.

1456

Read EEPROM from S-Bus over IP through a gateway fails.

1455

In CSF for "E-mail" or "Copy texts", text >= 4000 containing @@ or \$\$ result in a text that is 1 character to long.

Information for FW Flash programming.		
FW-file	Checksum	Label
PCD1M1x5_0A1.blk	---	D1.M1x5 ex work: - BOOTER V0A0 - FW V0A1

V0A0

This is the first official version for PCD1.M1x5

Information for FW Flash programming.

FW-file	Checksum	Label
PCD1M1x5_0A0.blk	---	D1.M1x5 ex work: - BOOTER V0A0 - FW V0A0