Saia-Burgess Controls Ltd.
Bahnhofstrasse 18 I CH-3280 Murten I Switzerland
T +41 (0)26 672 71 11 I F +41 (0)26 670 44 43

Subject:	**PCD2.M170 / PCD4.M170 FW VERSION V0F1**
Doc #:	**PCD2_4M170_0F1_Overview.doc**

PCD2.M170 / PCD4.M170 SUMMARY OF FIRMWARE VERSIONS

This document summarizes the changes of all firmware versions that are liberated on the PCD2.M170 / PCD4.M170 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 PCD2/4.M170

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. After the completion of a FW download, shown by the FW downloader taskbar, the code is then copied from the RAM to the FLASH. During this procedure, which takes about 30 sec, the RUN, HALT and ERROR LED's blink in a certain sequence.
- 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	$0B	$0C	$0D..$0K	$0L	$0M..$0Q	$0R..$0Z	B0{..010	017…
CPLD Version	mF71	mF73	MF75	m700	m701	m702	m703	M704

- PGU
  Default PGU mode is S-BUS parity therefore PG5, PG4 from version V1.3 upward or PG3 from version β2.0 upwards have to be used.

Memory

- User memory:

User prg mem.	HW	System Memory	FW	Default Memory configuration
None		1MBytes e.g.: 512+512kBytes		96k prg lines, 128k txt, 512k extended txt/db
Flash card (only back-up)		1MBytes e.g.: 512+512kBytes		96k prg lines, 128k txt, 512k extended txt/db

Note:
- Extended txt/db (txd/db number >= 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.
- ***Both*** the extended and lower range txt/db are in RAM and have read/write access by default.
- At flash card use both lower and higher range txt/db values are flashed together with the user program at the flash copy command from the PG5 as backup.
- The user program as well as the lower and higher txt/db range are copied to the PCD7.R400 backup module with the PG5 command “copy program to FLASH”.
- With PCD7.R400 produced after January 2010 (with the new Macronix A29800B FLASH) the new FW V0F0 is needed.

- 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 V010

- LD=/LDX=

- FB’s parameters can be use on the LD and LDX instructions. V020

- SASI

- Text accepts $R parameters. V010

  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)

- SYSRD/SYSWR
- SYSRD/SYSWR/SYSCMP/DEFTR instructions. V010
- SYSWR 1000: System watchdog V010
- SYSRD 660x for serial port mode read back added V020
- SYSRD/SYSWR 7050 to 7081 V010
  to read and write the different elements of the clock.
- SYSRD 7090 V010
  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 V010
  Added SF “ReadIPConfig” V030
- Application library V020
  including SFs “CopyText”, “InitDB”, “CopyDB2Registers”, “CopyRegisters”
  New “CopyBytes” SF V0F0

Communication

- Serial communication:
  - MC0/1/2/4, MD/SD, MM4 V010
  - MC5 mode that deactivate RS-485 drivers directly after completion of transmission. V010
  - 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. V010
  - Data-Mode V010
  - S-Bus Secure data mode. V030
    Option to disable the S-Bus secure data mode V0F0
  - Modem+ V010
  - Gateway (GM/GS). V010
- S-RIO as master and slave. V010
  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 V010
    10 channels (10...19) and 100 objects (100...199).
  - Extension (at least SPROF $137 is needed) V010
    possibility to map objects on DBs, read/write indicator, multicast/broadcast link, watchdog.
  - Extension for profile GA V010
- PROFIBUS DP: V010
  - master mode with PCD7.F750.

- slave mode with PCD7.F77x.
- Introduced signed values V030

- LON with PCD7.F80x:
  - Base functionality V010
  - LON enhancement with new functionality poll and alias (LON 1.5). V010
- Communication on TCP_IP with PCD7.F650/F652: V010
  - S-Bus over UDP/IP
  - “Open data mode” over TCP or UDP
  - SMTP E-Mail support
  - DHCP / UDP with the PCD7.F655
- WEB server V010
  - S-Web Alarming V030
- PGU switches automatically to 38.4 kBds (requires PG5 V1.2). V010
- Up to 2 ports could be configured/assigned at 38.4 kBds at the same time. V010
- It is possible to configure/assign port 0 (or 1) at 38.4 kBds and port 1 (or 0) at19.2 kBds. V010

Miscellaneous

- New features for PG5. V010
  - 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 V010
  - XOB 17, 18, 19: User XOB's V010
    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 V010
  - XOB 14/15: Cyclic XOB's
    can be executed from 5 ms to 1000s with 1ms steps V010
  - New XOB handling. V010

  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 V010
  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. V010