

## **COSinus 1.28.16 Release Note**

This document describes important notes for the COSinus FW version.

The COSinus FW is available for the following systems:

- \* PCD1.Mxxx0
- \* PCD2.M4x60
- \* PCD3.Mxx60
- \* PCD3.M6880
- \* PCD7.D4xxT5F

### **Important for FW update:**

Usually by FW update the application program, the Texts/DBs and the media (Flags, Registers, Timers/Counters) remains unchanged.

However:



Updating to FW 1.22.xx or newer from a version 1.16.xx deletes the data on SRAM.

⇒ PCD2.M5xx0 & PCD3.Mxxx0 (without PCD3.Mxx60):

The program, the media and all Texts/DBs are deleted. The program and the Texts/DBs will be restored from the “program backup” if present.

⇒ PCD1.M0xx0, PCD1.M2xx0 & PCD3.Mxx60:

The application program is not deleted whereas the media are cleared and the RAM Texts/DBs are restored from the “program file” or the “program backup”.

On PCD3.Mxx60 the INTFLASH size has been increased to 128MB. Therefore the File System on the INTFLASH will be reformatted and all files stored on this device will be lost.

Update to this FW from a version  $\leq 1.14.xx$  deletes the user program, the media and the onboard file system is formatted, all data on the flash (file system, backup program & DB's) are deleted.

If a program backup on an external device exists, it will be restored!

Downgrade FW from 1.26.xx to previous versions can delete configurations on PCD1.M0xx0, PCD1.M2xx0, PCD2.M4x60 & PCD3.Mxx60 because of the increase of None Volatile Registers.

## **Compatibility of COSinus with the PCD types**

This COSinus firmware 1.28.xx requires a PCD equipped with SD card and with 32MB DRAM.

The table hereafter presents the corresponding COSinus FW for the different PCD types as the required minimal HW revision

### **1.1 COSinus compatibility with PCD types and HW revision**

PCD System	HW revision		COSinus FW
	Listed on the sticker (System vers.)	Read by the PG5 (CPU vers.)	
PCD1.M0xx0 PCD1.M2xx0	F*	F*	PCD1.M2xx0_PCD2.M4x60_1.28.xx.blk
PCD1.M2110R1	\$A	F	
PCD1.M2220-C15	A	A	
PCD2.M4x60	A	A	
PCD3.Mxx60	A	A	PCD3.Mxx60_1.28.xx.blk
PCD3.M68x0	D	D	
PCD7.D4xxxT5F	A	A	PCD7.D4xxxT5F_Prog_1.28.xx.blk
PCD7.D443WT5F	A	A	PCD7.D4xx_ST3R2_LogicController_1.28.xx.blk
PCD3.T665 PCD3.T666 PCD3.T668	A	A	PCD3.T6xx_1.28.xx.blk

Note: \* On PCD1 hardware revision F is required to use the S-Monitoring function and LON FT-10.

### **1.2 Important information**

### 1.3 Compatibility of BACnet/LonIP with the PCD types

#### BACnet/LonIP FW compatibility with PCD FW

PCD FW	BACnet/LonIP FW
1.28.00 <-> 1.28.xx	1.28.00 <-> 1.28.xx

PCD System	LonIP FW	BACnet FW*
PCD1.M0xx0 PCD1.M2xx0 PCD1.M2110R1 PCD1.M2220-C15	LonIP_PCD1.M2xx0_1.28.xx.blk	BACnet Rev. 14: BACnetV2_1.28.xx.blk
PCD2.M4x60	LonIP_PCD3.Mxx60_1.28.xx.blk	
PCD3.Mxx60 PCD3.M6880		
PCD7.D4xxxxT5F		

- \* No old BACnet Stack is available for FW > 1.28.xx
- \* When update BACnet from previous version to Rev. 14 stack or higher PG5 2.2.210 is required. Migrate a previous used project the BACnet configuration must be set to Revision 14 in the BACnet configurator then rebuild and download the project to the upgraded PCD.

### 1.4 Compatibility of Ethernet Extension FW

PCD FW	Ethernet Extension FW
1.28.00 <-> 1.28.xx	1.28.00 <-> 1.28.xx

PCD System	Ethernet Extension FW
PCD3.Mxx60 PCD3.M6880	PCD3.M68x0_Eth2_1.28.xx.blk

Note: It is mandatory to update first the Extension FW to 1.28.xx before the Main FW. Old extension FW are not supported with COSinus FW 1.28.xx or newer even for FW update!

If the Extension has no FW (only Booter FW), it is no more possible to update the FW over the Main PCD. However, FW update from extension USB is always possible.

### 1.5 Compatibility of F2xx FW

This PCD FW version requires F2xx FW version 1.04.02 or higher.

PCD FW	F2xx FW
> 1.28.00	>1.04.02

## **2 New Features for COSinus 1.28.16 release**

This new firmware version of PCD Classic, identified as COSinus, contains a mix of new features as well as enhancements of existing functionality.

### **2.1 New features**

- When push button is pressed, while power on then do not update FW from FS in order to execute a delete all.
- Enhancement for HTTP server to transparently support sending compressed files.

### **2.2 Main corrections and improvements**

- SBUS parity mode, correction when NAK character is received as first byte of response.
- When download new Ethernet-RIO Program with the option 'Delete all backups' it can happen that the RIO is not commission and no goes no more in 'data exchange mode' until the PCD reboots.
- When RIO name is not in upper case the RIO file is not updated until a restart is executed.
- When RIO file is downloaded with download changed RIO file then RIO file is not sent to RIO until a restart is executed.
- Ethernet Frame Padding Information Leakage fixed [CVE-2017-9628]
- The Modbus CSF CloseSRPort does not free the port then a open/SASI call give an error and the port does not work.
- PCD can crash while power down when XOB 0 is programmed.
- MC0 mode with start/stop flag working again.
- Alarming does not work since 1.28.00 FW. (PCD7.D443WT5R)
- When watchdog timeout occurs PCD7.D443WT5R doesn't reboot and stays locked. (PCD7.D443WT5R)
- Various minor issues fixed
- Various BACnet issues fixed

## **New Features for 1.28.11 COSinus release**

This new firmware version of PCD Classic, identified as COSinus, contains a mix of new features as well as enhancements of existing functionality.

### **2.3 New features**

- BACnet Revision 14:
  - The Firmware has been extended to fully support BACnet Revision.14 (ISO 16484-5:2014, ASHRAE 135-2012).
  - New alarming functionality and properties have been added.
  - Improved performance between Registers/Flags and BACnet properties.
  - Critical persistent data is directly stored on SRAM.

- Client functionality has been extended with static address, device/object ID and device/object name binding.

**Restrictions:**

The Memory Module PCD7.R562 or PCD3.R562 is required to run BACnet Rev. 14 FW (PCD7.R560, PCD7.R561, PCD3.R560, PCD3.R561 are not supported anymore).

## **2.4 Improvements**

The following improvements have been done regarding precedent 1.26 versions:

- Download in RUN enhancements for Fupla
- Disable Program System Watchdog while program download
- Configuration of Program System Watchdog time
- HW Watchdog status to onboard input periphery
- Text Ram can now be cleared (all chars are set to blank space) with the cgi interface by writing a zero length string.
- Ping request on ETH2 over router from different sub net.
- LonIP Mapper improvement

## **2.5 Main corrections**

The following corrections have been done regarding precedent 1.26 versions:

- 38400/115200 baud settings for PCD1.M2xx0 & PCD3+ adjustment
- Battery status shows FAIL also if battery module is missing.
- PCD7.F7500 initialization on PCD2.M4x60
- Various Open Data Mode fixes: Read Timeout enhancement, Client Connection timeout and Client Keep alive with anonymous port issue fixed
- Modbus RTU on all ports but specially on the F2xx module has been corrected to handle the response timeout processing in the case that the response is just occurring at the moment of the timeout.
- Various minor issues fixed

## **Features or restrictions specifications**

### **2.6 General for all Systems**

Not usable with PG3 & PG4

Register extension: Up to 16383 Registers with PG5 V \$1.3.010 or newer.

FBox library: The Fbox of the analogue modules W1, W2 & W5 only working from PG5 V \$1.3.010 or newer.

The FW can be updated with the Firmware Download Tool (FWdnld.exe) located in the PG5 directory.

There is no CPLD programming.

Default PGU mode is S-BUS parity

New Configuration with PG5 2.0 for:

**1.14.00**

- FTP /File system
- New web-server / HTTP direct
- TCPIP/ enhancements:
  - DHCP/DNS

- SNMP
- PPP
- SNMP

- Bluetooth

- Clear Mapped Media

1.16.42

Program backup/restore

- Program backup in a “\*.Sbackup” file (PCD2.M5,PCD3) 1.10.00
- Program backup in a “\*.SBAK” file 1.16.22
- Backup including also the Configuration and the Media
- PG5 generated “\*.SPRG” file can be downloaded and restored in the PCD 1.20.25
- This file includes the "first time init data"

### 2.6.1 PCD1.M2220 & PCD2.M4x60:

To use the PCD1.M2220 & PCD3.M4x60 a PG5 2.2 or newer is required.

The user program and configuration are stored in the internal SD-Card memory.

Media and RAM DB/Text's are stored in FRAM, no battery is required.

Mapping of the PCD2.M4x60 Interrupt Inputs

1.26.02

### 2.6.2 PCD1.Mxxx0 & PCD3.Mxx60:

To use the PCD1.Mxxx0 & PCD3.Mxx60 a PG5 2.0 SP2 or newer is required.

The user program and configuration are stored in the internal SD-Card memory.

Mapping of the PCD3.Mxx60 Interrupt Inputs

1.22.08

## 2.7 Not implemented features

Mode MM4

LAN2:

Mode D

S-Bus-RIO as master.

PROFIBUS FMS

LON

Program backup to PCD7.R500 (PCD1 & PCD3+)

## 2.8 Memory

User memory PCD1.M2xx0

System	HW revision	User memory		Onboard File System
		Code/Text (ROM)	DB (RAM)	
M2110R1	-	256 kbytes	128 kbytes	8 Mbytes
M2020 M2120	-	512 kbytes	128 kbytes	8 Mbytes

M0160 M2160	-	1024 kbytes	512 kbytes	128 Mbytes
M2220	-	512 kbytes	128 kbytes	128 Mbytes

#### User memory PCD2.M4x60

System	HW revision	User memory		Onboard File System
		Code/Text (ROM)	DB (RAM)	
M4160	-	512 kbytes	128 kbytes	8 Mbytes
M4560	-	2 Mbytes	1 Mbytes	128 Mbytes

#### User memory PCD2.M5xx0

System	HW Revision	User memory Code/Text/DB (RAM)	Default Memory configuration	Onboard File System
M5440 M5540	HW >=D	1024 Kbytes	96k prg lines, 128k txt, 384k ext.	-



Note: At first memory configuration the FW makes an allocation with the maximum space available depending on the RAM/EPROM/FLASH chip.

#### User memory PCD3.Mxxx0

System	HW Revision	User memory Code/Text/DB (RAM)	Default Memory configuration	Onboard File System
M2030 M2130 M2230 M2330	-	512 Kbytes	48k prg lines, 64k txt, 256k ext.	1MBytes
M3020 M3120	HW >=E Mod 48	256 Kbytes	12k prg lines, 16k txt, 64k ext.	-
M3230 M3330	HW >=D	512 Kbytes	48k prg lines, 64k txt, 256k ext.	-
M5240 M5340 M5440 M5540 M6340 M6540	HW >=D	1024 Kbytes	96k prg lines, 128k txt, 384k ext.	-



Note: At first memory configuration the FW makes an allocation with the maximum space available depending on the RAM/EPROM/FLASH chip.

#### User memory PCD3.Mxx60

System	HW Revision	User memory		Onboard File System
		Code/Text (ROM)	Ext. (RAM)	
M5560	-	2 Mbytes	1 Mbytes	128 Mbytes

M6360				
M6560				
M6860				

#### EEPROM:

- The S-Bus configuration is automatically saved in the EEPROM, this means that even if the battery or super cap becomes discharged the S-Bus configuration will be safe.
- There are 50 non-volatile user registers.
- Increases Non Volatile Registers to 1000 for PCD1.Mxxx0, PCD2.M4x60, PCD3.Mxx60 PCD7.D4xx. **1.26.15**

#### Media:

- Up to 16383 Registers **1.06.16**
- Up to 16383 Flags **1.20.25**

#### DB backup (SYSWR 3xxx):

- Fix size for onboard flash 256kB **1.16.24**

## 2.9 Instructions

Please refer to the following list which indicates the first firmware version used in production supporting the relevant feature.

SYSWR 900x or SYSWR 300x

Peripheral instructions **1.08.23**

PB, FB Temporary Data **1.10.16**

2000 FB's, 1000 PB's, 32 COB's **1.10.16**

FB call depth of 31. **1.08.23**

IEEE floating point instruction for single and double **1.10.16**

Signed extension instruction EXTB, EXTW **1.10.16**

#### System Functions SF

- SF for text **1.10.16**
- SF read DB/Text length **1.20.25**
- SF for CRC Calculation **1.20.25**
- SF to convert time std<->unix time **1.22.08**
- SFs for AES128 encryption/decryption **1.22.08**
- SFs for MD5 hash and AES, DES, 3DES cipher encryption **1.24.05**

SYSRD 71xx (UTC Time) **1.20.25**

#### Interpreted Text

- New \$lnnnn and @lnnnn encoding for interpreted Texts Containing Data **1.20.25**
- DB for interpreted Texts Containing Data(\$bxxxx.yyyyyy) **1.20.25**

## 2.10 Communication

#### Serial port on PCD1.Mxxx0

- The port 0 is for RS485
- The port 1 has a full RS 232 if it is equipped with F121



#### Serial port on PCD1.M2220

- The port 0 is for RS485 w. Echo mode
- The port 1 is for RS485 w. Echo mode

#### Serial port on PCD2.M4x60

- The port 0 is for RS485 w. Echo mode
- The port 1 has a full RS 232 if it is equipped with F121

#### Serial port on PCD2.M5xx0

- The port 0 has RS 232/RS485 switch
- The port 0 has a full RS 232 (a modem can be equipped)
- The port 1 has a full RS 232 if it is equipped with F121
- The port 2 has a full RS 232 if it is equipped with F121
- The port 3 is for RS485 or Profi-S-Net as port 10

#### Serial port on PCD3.Mxxx0 & PCD3.Mxx60

- The port 0 has a full RS 232 (a modem can be equipped)
- The port 1 has a full RS 232 if it is equipped with F121
- The port 2 is for RS485 & Profi-S-Net (M3xx0 & M6xx0)
- The port 3 is for RS485 or Profi-S-Net as port 10 (M5xx0)

#### New Serial port with PCD3.F2xx

- Port 100 & 101 on Slot 0
- Port 110 & 111 on Slot 1
- Port 120 & 121 on Slot 2 (not on PCD1.Mxxx0)
- Port 130 & 131 on Slot 3 (not on PCD1.Mxxx0)
- S-Bus Driver on F2xx module
- Baudrates 300/600/1200

**1.22.00**

**1.26.15**

#### Serial communication

- Baudrates up to 115k Baud
- No Baudrates < 1200 on all port

#### S-Bus

- Baudrates up to 115k Baud
- CSF for Send/Receive.
- No break modes as master and slave.
- No parity modes as master (SM1) on port 0 & 1. (PCD1.Mxxx0)
- No parity modes as master (SM1) on port 2 & 3. (PCD2.Mxxx0)
- No parity modes as master (SM1) on port 0 & 3. (PCD3.Mxxx0)

#### Modem

- Auto answer modem on port 0 and 1 (analogue & ISDN)

#### PROFIBUS DP

- Transfer of signed values possible, with PG5 SP1.4.120 or newer
- Master mode on Port 10 with PCD3.M64x0 / PCD3.M65x0
- Slave mode with MPI/S-Net port 10.
- Slave mode with MPI/S-Net port 2 (with maximal baudrate = 187.5Kb).

**030**

**020**

**010**

**010**

#### Profi-S-IO

- Transfer of signed values possible, with PG5 SP1.4.120 or newer
- Master / Slave mode with MPI/S-Net port 10.
- Master / Slave mode with MPI/S-Net port 2 (with maximal baudrate = 187.5Kb)

**030**

**010**

**010**

- MPI for Terminal R/W OP  
 (please contact SAIA-Burgess Controls for more information)

#### Communication on TCP\_IP

- Classless inter domain router **039**
- S-Bus over IP **010**
- "Open data mode" over IP with max. 32 ports / 32 connections **010**
- S-Bus GWY Master over IP **010**
- 255 ARP table entries **1.10.16**
- PGU address for Ether-S-Bus **1.20.25**
- ACL Mac/IP Lists **1.22.00**
- Web-FTP encoded Passwords **1.22.00**

WEB server **010**

WEB server with HTTP direct connection **020**

WebServer2 **1.10.16**

IP filtering **1.22.08**

Improve the robustness of the system against Ethernet storm. **1.24.05**

PPP (Point to Point Protocol) **1.10.16**

- Configuration through file, WEB-CGI and CSF
- No FBox support
- All serial ports available

SNTP (Simple Network Time Protocol) **1.10.16**

- Configuration through file and WEB-CGI

DHCP **1.10.16**

DNS **1.10.16**

SNMP **1.14.00**

PING **1.14.03**

FTP

- Passive mode **1.22.08**
- Dynamic password for FTP (service key) **1.22.08**

Config Tags for eDisplay **1.10.16**

PGU switches automatically to 115 kBds. **010**

No limitation with the baudrate configured/assigned. **010**

#### Profi-S-Bus

- Master & Slave mode with MPI/S-Net port 10. **010**
- Profi-S-Bus GWY Master. **010**

Multi PGU (incl. modem) **010**

S-Bus over USB **010**

CAN on Port 10, PCD3.M63x0 only **020**

RS422/RS485 on port 3 of PCD3.M5240 and PCD3.M5340 **030**

MODBUS Driver over TCP/IP, UDP and serial **1.10.16**

- Accessible over CSF calls only
- Serial port 0, 1, 2 and 3.

▪ No support for F2xx serial lines (port 100 .. 131)	
▪ MODBUS serial on F2xx module and inter-character timeout as parameter	1.22.00
Lon IP	
▪ Support the LonIP Module PCD3/7.R580/581.	1.14.00
▪ PCD7.R582 ;128MB memory card with LON/IP	1.20.25
PCD2.F2400 ;LON FTT-10 com. module	1.20.25
PCD2.F2150 ;BACnet MS/TP com. module	1.20.25
Ether-S-IO	
▪ Support Ether-S-IO RIO	1.16.00
M-BUS Communication modules supported (PCD2.F2700, PCD2.F2710, PCD2.F2720, PCD2.F2730)	
▪ Support for these modules with "Frame" protocol	1.16.48
DALI Communication modules supported (PCD2.F2610)	
▪ Support for these modules with "Frame" protocol	1.16.48
▪ DALI master commands receive channel implementation	1.20.25
S-Bus/Modem configuration over Tags	1.20.25
Integrate PCD1.F2300 (PCD1)	1.20.25
LON FT-10	1.24.05
New SFs and communication driver for the E-Line devices	1.24.05

## **2.11 New I/Os modules**

PCD2/3.B160 supported	1.16.51
PCD2.G200 for PCD1.Mxxx0 & PCD2.M5xx0	1.22.11
▪ PCD2.G200 Module enhanced Configuration	1.22.25
PCD2/3.W380 analogue Input Module	1.22.14
PCD7.W600 analogue Module	1.24.05

## **2.12 Miscellaneous**

IL code of analogue modules W1, W2 & W5 must change (see manual).	010
New features for PG5.	010
▪ 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 20-21: interrupt inputs XOB's	010
▪ XOB 14, 15, 25-29 Time Cyclic Alarm	010
- can be executed from 1 ms to 1000s with 1ms steps	010
- can be executed only one time with SYSWR 41xx	010
▪ XOB 17, 18, 19: User XOB's	010

- 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 010
- XOB 1 and 2 Status call (see manual) 010
- XOB 1 and 2 Status call (see manual) 010
- New XOB handling.
- The XOB's are split in 2 priorities. A higher prior XOB can interrupt the lower prior XOB. (see manual)
- XOB 32-63: configurable for CAN (PCD3.M6340, PG5 V\$1.3.127) 020
- XOB 3 for task and Task data overflow 1.10.16

Calculation of week and day number 010

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. 010

Copy user program from flash to SRAM without PG 010

File system. 020

- CSF asynchronous 039
- 6 File devices (2 internal, 4 external Flashcards) 020
- Onboard File system for configuration files 1.10.16
- PCD7.R550M128 ;128MB memory card 1.20.25

FTP server 020

Flash Modules PCD3.R5xx are supported on the IO Slots 0..3 020

SD Flash Modules PCD3.R6xx are supported on the IO Slots 0..3 030

- Allow to overwrite data on a SD card (PCD3.R600/PCD2.M6000) file system. 1.10.16

Alarm DB 039

- Number of parameters changed 039

Data Initialisation DBX 1.10.16

"Memory lost" history entry 1.10.16

Integration of L&S NI1000 Temperature Sensors on dif. W- Module 1.20.25

New History 1.20.25

- FW download give a history entry 1.22.00

EnergyManager S-Monitoring (PCD1, PCD3+) 1.20.25

- 5 min logging in the S-Monitoring

Download in Run Changed blocks (PCD1, PCD3+) 1.20.25

- Download in RUN Config DBX, Ether-SIO Config (PCD1,PCD3+) 1.20.25

PCD7.R610 uSD Module 1.24.05

Easy update functionalities => FW update & restore of the application including the Web pages from a \*.sprg file. 1.24.05

## **BACnet**

TrendLog to non SD flash (PCD7.R550M04/PCD7.R551M04/PCD7.R561) supported.	<b>1.24.17</b>
Add new Objects TLM, EL, SV to web interface.	<b>1.24.00</b>
Config for second Ethernet on PCD3.M6860	<b>1.22.04</b>
BACnet MS/TP	<b>1.20.25</b>