

**Migration guide
comX 10 to comX 52**



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1 Introduction

1.1 About this manual

This migration guide gives you an overview on the changes between the comX 10 and the comX 52 communication modules. It shows you how to replace comX 10 module with a comX 52 module in your design.

1.2 List of revisions

Index	Date	Chapter	Revision
1	2020-11-27	All	Document created.
2	2021-03-05	All	COMX 52CN-DPS, COMX 52CN-COS, and COMX 52-DNS added.

1.3 References to documents

This document refers to the following document:

- [1] Hilscher Gesellschaft für Systemautomation mbH: Serial Dual-Port Memory Interface with netX, Getting Started Guide, DOC120210GS06EN, Revision 6, English, 2012.

2 Comparison

2.1 Overview

The comX communication modules listed in the following table have been designed to replace the comX 10 communication modules: drop-in replacement.

End of life		Replacement	
Module	Part number	Module	Part number
COMX 10CA-DPS	1561.420	COMX 52CA-DPS	1581.420
COMX 10CA-COS	1561.540	COMX 52CA-COS	1581.540
COMX 10CA-DNS	1561.520	COMX 52CA-DNS	1581.520
COMX 10CA-CCS	1561.740	COMX 52CA-CCS	1581.740
COMX 10CN-DPS	1562.420	COMX 52CN-DPS	1582.420
COMX 10CN-COS	1562.540	COMX 52CN-COS	1582.540
COMX 10CN-DNS	1562.520	COMX 52CN-DNS	1582.520

Table 1: List of replacement modules

The comX 52 modules use the netX 52 processor instead of the netX 10 processor.

2.2 Hardware

2.2.1 Mechanics

The comX 52 module is mechanically compatible to the comX 10 module.

Topic	Compatibility
Size	Same size: 30 x 70 mm
Connectors	Same position and same dimensions
Mounting blocks	Same position and same dimensions
LEDs	Same position and same dimensions
Rotary switches	Same position and same dimensions

Table 2: Mechanical compatibility

2.2.2 Electrical compatibility

The table below explains the topics concerning electrical compatibility of the comX 52:

Topic	Compatibility
Pin assignment	The pin assignment of the connectors of the comX 52 is compatible to the comX 10 modules. This also includes the boot pins and the 8 JTAG pins.
Host Interface	Dual-port memory (parallel): As for all other comX modules
	SPM: Accessing the serial dual-port memory does not differ between the comX 52 and comX 10 modules.
SYNC	Not used at comX 10 and comX 52

Table 3: Electrical compatibility

2.2.3 Power supply

The following table compares the current consumption of comX 10 and comX 52 modules.

Device	Current	comX 10	comX 52
COMX 10CA-DPS / COMX 52CA-DPS	typical	200 mA	400 mA
	maximum	230 mA *	440 mA *
COMX 10CA-COS / COMX 52CA-COS	typical	250 mA	370 mA
	maximum	290 mA	400 mA
COMX 10CA-DNS / COMX 52CA-DNS	typical	250 mA	400 mA
	maximum	290 mA	440 mA
COMX 10CA-CCS / COMX 52CA-CCS	typical	225 mA	tbd.
	maximum	260 mA	tbd.
COMX 10CN-DPS / COMX 52CN-DPS	typical	200 mA	385 mA
	maximum	230 mA *	410 mA *
COMX 10CN-COS / COMX 52CN-COS	typical	250 mA	380 mA
	maximum	290 mA	400 mA
COMX 10CN-DNS / COMX 52CN-DNS	typical	250 mA	410 mA
	maximum	290 mA	430 mA

Table 4: Typical and maximum current values for comX 10 and comX 52

* Maximum current for normal operation

2.2.4 Temperature range

The temperature ranges for operation and storage of the comX 52 modules are identical to that of the comX 10 modules

Condition		comX 10	comX 52
Operating temperature	Minimum	-20 °C	-20 °C
	Maximum	+70 °C	+70 °C
Storage temperature	Minimum	-40 °C	-40 °C
	Maximum	+85 °C	+85 °C

Table 5: Temperature range

comX 10 and comX 52 have no heatsink.

2.2.5 Dual-port-memory size

In all variants, the comX 52 modules have an 8 KB Dual-Port-Memory as comX 10 modules.

	COMX 10	COMX 52
Dual-port-memory size	8 kB	8 kB

Table 6: Dual-port-memory size

2.2.6 Dual-port memory (parallel) timing

The following table gives the values for the timing parameters for comX 10 modules using the netX 10 chip and for comX 52 using the netX 52 chip.

For exchangeability of comX 10 and comX 52 communication modules, see column **Common** of Table 7.

In time-critical applications: take into account the partly differing timing parameters of the netX 52 processor in comX 52 and the netX 10 in comX 10.

Symbol		Description	COMX 10 netX 10	COMX 51/52 netX 51/52	Common
t ₁	t _{AS min.}	Minimum address setup time	0 ns	0 ns	2 ns
t ₂	t _{BV max.}	Maximum Time from cycle start until BUSY _n signal is valid	5.7 ns	5,7 ns	40 ns
t ₃	t _{BAR typ.}	Typical BUSY active time (read access)	-	-	-
	t _{BAR max.}	Maximum BUSY active time (read access)	68 ns	68 ns	-
t ₄	t _{BAW min.}	Minimum BUSY active time (write access)	0 ns	0 ns	0 ns
	t _{BAW max.}	Maximum BUSY active time (write access)	68 ns	68 ns	-
t ₅	t _{DVR min.}	Minimum Time between valid data bus signals and rising edge of BUSY _n signal	7,8 ns	7,8 ns	5 ns
t ₆	t _{DSW min.}	Minimum setup time for write data	10.8 ns	12.8 ns	25 ns
t ₇	t _{DHR min.}	Minimum read data hold time	2.1 ns	2.1 ns	0 ns
t ₈	t _{DHW min.}	Minimum hold time for write data	0.8 ns	2.8 ns	2.8 ns
t ₉	t _{AHR min.}	Minimum address hold time	0 ns	0 ns	0 ns
t ₁₀	t _{AHW min.}	Minimum address hold time	0.9 ns	2.9 ns	2.9 ns
t ₁₁	t _{RWI}	Minimum inactive time for RD _n or WR _n	10.5 ns	12.5 ns	12.5 ns

Table 7: Symbols for COMX timing diagram for read and write access

2.2.7 Serial dual-port memory

Enabling the serial DPM interface

The serial DPM interface is disabled by default.

It can be enabled during the boot process via the DIRQ and SIRQ signals which are evaluated by the Second Stage Bootloader (requires bootloader version 1.4.8 or newer).

The serial DPM interface can also be enabled permanently by using a patched version of the Second Stage Bootloader.

For more information, see reference [1], chapter 3.

Protocol of serial dual-port memory

The serial dual-port memory works slightly different at netX 52 and netX 10. Protocol differences are explained in reference [1] , chapter 5.

2.3 Firmware

2.3.1 Firmware file and version

The following table lists the firmware file name.

comX 52 module	Protocol	Firmware version	File name
COMX 52CA-DPS COMX 52CN-DPS	PROFIBUS-DP Slave	V2.11	M0702000.nxf
COMX 52CA-COS COMX 52CN-COS	CANopen Slave	V3.8	M0705000.nxf
COMX 52CA-DNS COMX 52CN-DNS	DeviceNet Slave	V2.7	M0707000.nxf
COMX 52CA-CCS	CC-Link Slave	V2.13	M0709000.nxf

Table 8: Protocols and firmware versions supported by the comX 52 modules

The comX 52 modules come along preloaded with firmware.

2.3.2 Bootloader

Compared to the former comX 10 modules, another bootloader is required due to different processor (netX 52).

The second stage bootloader V1.6.0.1 is used on the comX 52 modules.

2.3.3 Device description files

The following table lists the file names of the device description file.

Fieldbus	File name (COMX 10)	File name (COMX 52)
PROFIBUS-DP Slave	HIL_0D82.GSD	HIL_1163.GSD
CANopen Slave	COMX 10XX-COS COS.eds	COMX 52XX-COS COS.eds
DeviceNet Slave	COMX_10XX-DNS_DNS.EDS	COMX_52XX-DNS_DNS.EDS
CC-Link Slave	0x0352_COMX10XX-CCS_2.11_en.cspp 0x0352_COMX10XX-CCS_2.11_en.cspproj	0x0352_COMX52-CCS_2.11_en.cspp 0x0352_COMX52-CCS_2.11_en.cspproj

Table 9: Device description files

2.4 Configuration

2.4.1 Configuration software

The configuration software must provide support for the combination USB Vendor ID 0x1939 and USB Product ID 0x0205 denoting „comX with netX 52 Chip“.

In order to meet this requirement, use a current version of SYCON.net V1.0500 (build 201127 or newer).

2.5 Driver

2.5.1 Driver and driver toolkit

The comX 52 has been designed as a drop-in replacement, which is compatible to the comX 10.

Drivers

CIFX Device Driver V1.3 or higher version.

Driver toolkit

CIFX Driver Toolkit V1.5 or higher version.

2.5.2 USB driver

comX 52 (Vendor ID 0x1939, Product ID 0x0205) has been added to the USB Driver, starting with version 1.2.14.0.

The USB Driver is located on the product DVD in the folder:

```
Driver and Toolkit\USB Diagnostic Driver\  
USB netX51 and netX52_Dummy
```

2.6 Identification

Category	Feature	comX 10	comX 52
Dual-port memory	Device class	0x0020 HIL_HW_DEV_CLASS_COMX_10	0x0047 HIL_HW_DEV_CLASS_COMX_52
USB Driver	USB: Vendor ID	0x1939 ("Hilscher")	0x1939 ("Hilscher")
	USB: Product ID	0x0110 („comX with netX 10 Chip“)	0x0205 („comX with netX 52 Chip“)
PROFIBUS DP-Slave	Ident number	COMX 10XX-DPS: 0x820D	COMX 52XX-DPS: 0x1163
CANopen Slave	Identity-Object (0x1018)	COMX 10XX-COS: Order Number "1561540"	COMX 52XX-COS: Order Number "1581540"
DeviceNet Slave	CIP Product Code	COMX 10XX-DNS: 0x0036	COMX 52XX-DNS: 0x003D
CC-Link Slave	Model code	COMX 10XX-CCS: 0x03	COMX 52XX-CCS: 0x07

Table 10: Identification

3 Migration steps

In order to migrate your hardware design from comX 10 to comX 52, perform the following steps:

1. Check the dimensioning of the power supply within your design.
2. Install a current SYCON.net, at least V1.0500 (build 201127 or newer).
3. Install a suitable USB driver, see section *USB driver* on page 11.
4. Reconfigure the Fieldbus master using the device description file of the COMX 52.
5. Only if permanent use of serial dual-port memory is intended: Patch the Second Stage Bootloader.
6. Adapt time-critical applications, if necessary.
7. Take care of possible slight differences in the API of the used protocol stack between the versions used for comX 10 and comX 52.

Remark on product identification

Identification of comX 52 and comX 10: comX 52 uses another Device Class and another USB Product ID compared to comX 10. This affects migration steps 2, 3 and 4.

3.1 Verifying hardware design concerning dimensioning of power supply

This step is mandatory.

The current and power requirements of the netX 52 processor within the comX 52 significantly exceed those of the formerly used netX 10 processor.

For typical and maximum current values, see section *Power supply* on page 6.

Verify your hardware design whether the power supply can meet the increased current and power demand of the comX 52.

3.2 Installing USB driver

This step is necessary, if you intend to use any of the following comX features

- Firmware update over USB
- Diagnosis over USB
- Serial DPM over USB

Install an appropriate USB driver for comX 52.

Beginning with version V1.2.14.0, the USB driver uses both the Device Class (0x47) and the USB Vendor ID 0x1939 and USB Product ID 0x0205 for comX 52, see section *USB driver* on page 11.

Checking the USB driver for suitability

You can check whether a driver with support of COMX 52:

The file `driver_history.txt` delivered with the driver and installed below the drivers installation directory, must contain the following section:

```
V1.2.14.0 (9.7.2020)
-----
- added VID 0x1939 PID 0x0205 (comX)
```

3.3 Installing SYCON.net

This step is necessary, if you want to configure the comX 52 with SYCON.net:

Use SYCON.net V1.0500, build 201127 or newer.

Checking the SYCON.net installation for suitability

SYCON.net has comX 52 in the device catalog.

3.4 Reconfiguring of the Fieldbus master

This step is mandatory.

Replacing the COMX 10 with a COMX 52 module, the fieldbus master has to be reconfigured. Therefore use the device description file for the COMX 52 module as listed in Table 9 on page 10.

In the configuration software, import the device description file for COMX 52. In the configuration dialogues, you can select the same modules and parameter as in the configuration for COMX 10 module.

3.5 Enabling permanent use of serial dual-port memory

This step is only necessary if you intend to enable the use of serial dual-port memory of the comX 52 permanently.

If you have used the comX 10 with a Second Stage Bootloader patched for explicit use of serial dual-port memory, you will have to repeat patching of the Second Stage Bootloader.

Steps:

- Use Second Stage Bootloader V1.6.0.1 or higher.
- Follow the patching instructions given for netX 51/52 in reference [1], subsection "Changing the Second Stage Loader DPM handling to SPI".

3.6 Adapting time-critical applications

This step is only necessary for time-critical applications adjusting the parameters listed below that do not use the set of common parameter settings.

Some timing parameters slightly differ between the netX 10 processor used in comX 10 and the netX 52 processor used in comX 52. This affects the following parameters of the parallel dual-port memory:

- Minimum setup time for write data ($t_{DSW \min}$)
- Minimum hold time for write data ($t_{DHW \min.}$)
- Minimum address hold time ($t_{AHW \min.}$)
- Minimum inactive time for RDn or WRn (t_{RWI})

For exchangeability of comX 10 and comX 52 communication modules, a set of common parameter settings has been defined that allows running an application with all types of netX processors, see column **Common** of Table 7 on page 8.

If your application is time-critical, then you have to check whether your application already uses this common parameter set. If this is the case, your application will run on comX 52 without any change. Otherwise, you have to adapt your application accordingly.

If compatibility with netX 10 is not required, you might also use the optimized parameter set for netX 52, see column **COMX 51/52 netX 51/52** of Table 7 on page 8.

3.7 API

In case the application identifies the used COMX module, use the value for Device class for COMX 52 modules as listed in Table 10 on page 12 to allow the application to accept COMX 52 modules.

PROFIBUS-DP Slave

comX 52 uses PROFIBUS-DP Slave stack V2.11 instead of V2.10.

CANopen Slave

comX 52 uses CANopen Slave stack V3.8 instead of V3.7.

Device Net Slave

comX 52 uses DeviceNet Slave stack V2.7 instead of V2.5.

CC-Link Slave

comX 52 uses CC-Link Slave stack V2.13 instead of V2.12.

4 Appendix

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