

Communication

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Commercial Information 2003-05: Update LON network Interface

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Saia® PCD CI Information 2003-05

Update LON network Interface

Murten, 20th May 2003

Dear Ladies and Gentlemen

Please find enclosed the newest information regarding new LON possibilities. The following points are mentioned in this information.

- 1 Firmware / LON driver support
- 2 SNET adjustment / New functionalities
- 3 SFUP Update
- 4 Flash memory use for extended save of LON binding information (Dbx)
- 5 Main benefit

1. Firmware / LON driver support

Existing LON driver versions

Different Firmware versions with non identical LON driver versions exist. The following table indicates the LON properties in those drivers:

Firmware description	LON properties
Firmware with LON driver 1.3	Officially delivered version! This version has some major drawbacks on stability and may corrupt the LON network sending erroneously at unexpected addresses over non bound SNVT. If possible it should be replaced by a newer version.
Firmware with LON driver 1.4	Corrected version. The latest \$ versions <u>must be used by all PG4 and earlier PG5 users</u> and has no known errors. <i>New PG5 users may use these latest versions also.</i>
Firmware with LON driver 1.5	Enhanced version with new functionality poll and alias . <u>These firmware versions requires a new PG5 version</u>

The difference between "early" and "new" PG5 is explained in the table "supported software versions"!

Driver / Firmware table

The following table shows which driver versions are supported within the available firmware versions.

PCD type	Driver 1.3 (obsolete)	Driver 1.4 Tested version (for PG4 / early PG5)	Driver 1.5 (for new PG5 only)	Current Version (Recommend to use)
PCS1x	None	None	090 (official version)* \$89 upwards (pilot versions)	B93
PCD1.M130	07x	\$71	080 (official version)* \$79 upwards (pilot version)	BF7
PCD2.M120	08x	\$84	090 (official version)* \$88 upwards (pilot version)	B89
PCD2.M150	0Bx	\$B6	0C0 (official version)*	BBC
PCD2.M170	None	\$OL	010 (official version)* \$OR upwards (pilot version)	B0~
PCD4.M170	None	None	010 (official version)* \$0Q upwards (pilot version)	B0~

* The official version will be available in June 2003

Supported software versions

The following PG4/5 versions have the specific contents of software parts as shown in the following table:

PG version	Firmware interface	Fupla	SNET
PG 4 PG5.1.0 PG5 1.1 until pilot version \$1.1.110	All firmware with LON driver version 1.3 and 1.4	Limited LonMark V.8 support	Limited LonMark V.8 support
PG5 1.1.all pilot versions from \$1.1.130 upwards	All firmware with LON driver version 1.5, 1.4 and 1.3	Limited LonMark V.8 support	LonMark V.10 support with added new functionality
PG5 1.1.132 Special Update for PG5 1.1.130	All firmware with LON driver version 1.5, 1.4 and 1.3	Full LonMark V.11 support	LonMark V.11 support with added new functionality
Pilot version \$1.2.006 upwards	All firmware with LON driver version 1.5, 1.4 and 1.3	Limited LonMark V.8 support	LonMark V.10 support (LonMark V.11 from pilot version \$1.2.008 upwards) with added new functionality
PG5.1.2 official version (expected June 2003)	All firmware with LON driver version 1.5, 1.4 and 1.3	Full LonMark V.11 support	LonMark V.11 support with added new functionality

Full LonMark support:

All SNVT types are supported in FUPLA by a specific F-Box or a new generic box.

LonMarks version 8,10 and 11 give the definitions of the LON SNVT. The LonMark Standard version 11 supports 166 different SNVT's. For more information see also SNVT list in the help files or the determined LON documentation!

2. SNET Adjustment (PG5 1.2)

The new SNET is compatible to all firmware with LON driver version 1.5, 1.4 and 1.3.

It has the following new possibilities:

- PCD2.M170 support
- LON firmware exchange/selection
- Copy function
- Polling methods
- Alias table support

PCD2.M170 support

With the use of the PCD2.M170 it will be necessary to support the hardware and to choose the slot where the LON card is mounted (B₁ Slot / B₂ Slot).

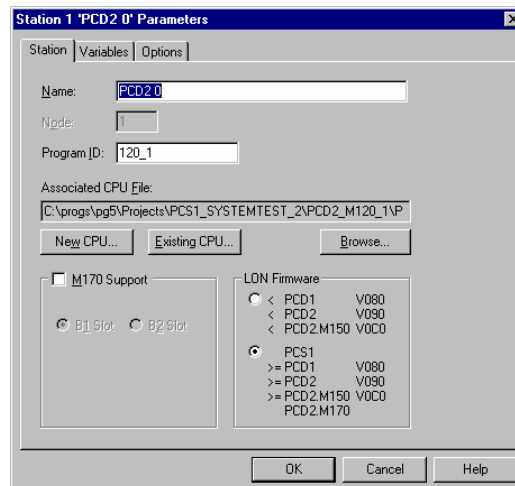
It is not allowed to have more than one PCD7.F800 / F802 on a single controller.

LON firmware selection

The new SNET configurator (equal or higher PG5 1.1.130) is compatible to all firmware with LON driver version 1.3, 1.4 and 1.5.

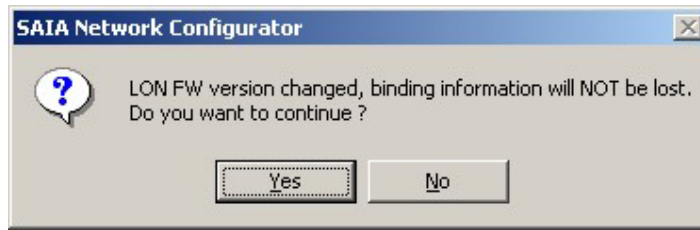
To use new functionalities as poll function and/or alias table which are only supported within LON driver version 1.5, it is necessary to upgrade the firmware to a newer version.

In existing PCD systems the firmware can be updated without any restrictions! That means the system will not loose any binding information and for the upgrade no binding tool is required.



The update of the PCD systems with a new firmware version is provided with the SNET option “LON firmware”.

During the operation the following message window will appear:



To prevent lose binding information are the following work steps required:

- Execute a restart of the controller after the final binding connection.
- Upload the Dbx information into the PG5 project.
- Turn off the power supply of the controller and change the PCD firmware.
- Change the firmware option within the SNET to the especial position.
- Rebuild the project and download it

Copy function

The LON configuration is saved within the "name.lon" file. If required it would be possible to move this "name.lon" file from one CPU to another CPU of the same type, with using the PG5 "add files" feature. Even if the CPU is defined with another PG5 version.

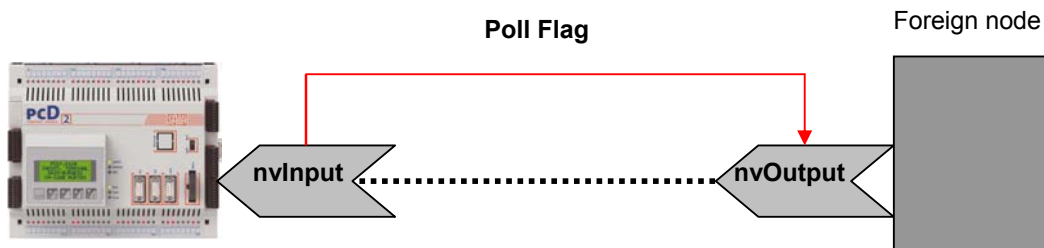
Polling Settings (Binding required)

With a newer version of SNET (equal or higher PG5 1.1.130) and the appropriate firmware it is possible to poll information out of a SNVT network variable.

A polled network variable is an output network variable, which sends its contents only on the basis of a polling request. Usually network variables send automatically their contents if something has changed in the application program (event oriented).

The opposite input network variable updates its contents on the basis of a polling request to an output variable.

The PCD with the input network variable is always the polling one, the opposite side with the output network variable is always the polled one.



The poll flag which is required to select a poll functionality for a SNVT (Standard Network Variable Type) can be set within the definition window of the chosen variable. (See example below)

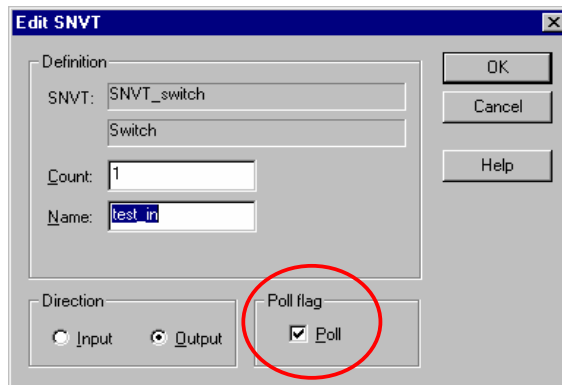
Polling without existing Binding connection (fetch method)

The PCD / PCS controller will update the transmission buffer with the latest variable information for polling without some bindings if the Poll flag is activated. The minimum requirements for this feature are:

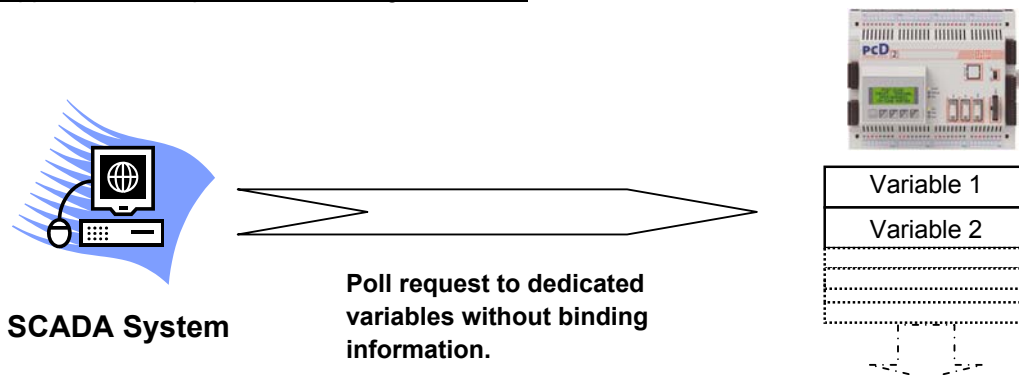
- PG5 1.1.132
- LON library 2.3.051 (or higher)
- Firmware \$-Version for driver 1.5 support, as mentioned within the “Driver/Firmware table” above

To provide the especially variable value on the LON net would is it necessary to activate the “Poll flag” in the network configurator S-Net.

If the Poll flag for each SNVT variable is not selected, an update of the polled network value is not guaranteed. Furthermore will the F-Box LED indicate a communication problem when the value is sent because of missing binding information.



Polling application example without binding connection



Important Note:

PCD/ PCS Systems are not able to poll out variables of an external node by using “fetch methode” without existing Binding connection!

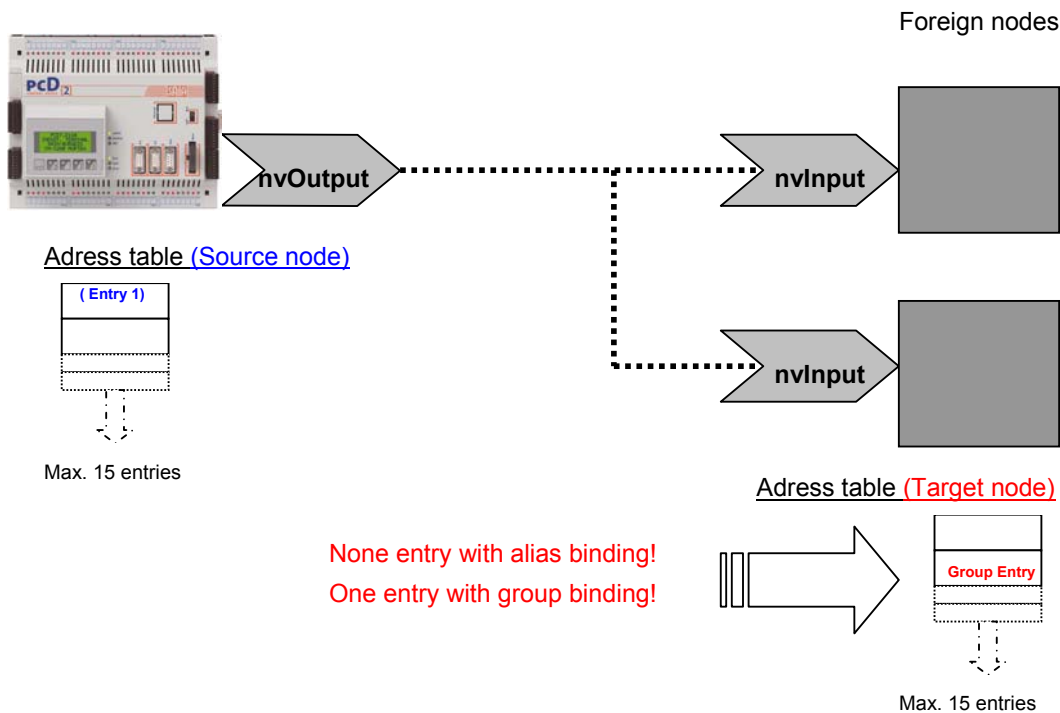
Alias support

The PCD supports now also a "multicast" transmission by alias.

To expand the limitation of 15 address tables with "acknowledged" unicast binding method, are there different "multicast" possibilities. One of them is the "**alias functionality**".

With use of the alias function is it possible to send an information to (or from) a defined group of variables (1 to N or N to 1) with an address table entry only in the source node.

Unlike group binding is it possible to save address table entries! Due to a limitation of normally required address table places, has only the source node an entry! With a normal group binding all group members (source and target node) will have an entry in the address table!

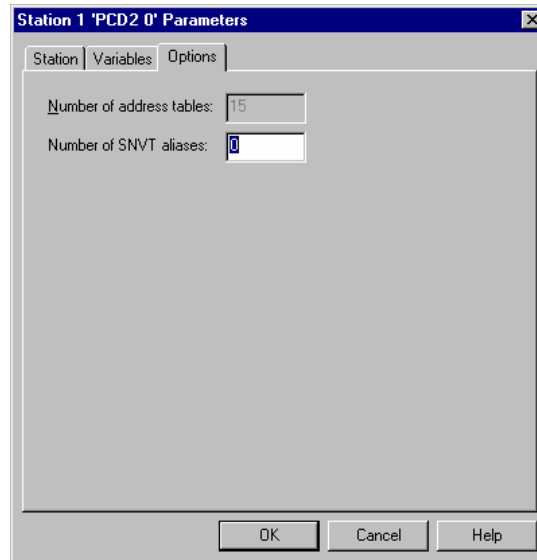


This feature needs a predefinition of a supposed amount of alias supported SNVT's. It is adjustable within the SNET menu "option" and the window "number of SNVT aliases".

The window allows to define an amount of alias supported SNVT. This number of aliases indicates how many variables will be used with an alias function. It is recommended to set the amount of alias SNVT's in the range of the expected SNVT's with alias functionality.

Note:

Be careful with the amount of registered alias range. Alias table needs memory space!



The definition of supported alias functionality is needed in every connected network member. **If one of them are not alias supported (i.e. the predefined number of aliases are too small) the binding tool will force the connection automatically to a group binding!**

That takes an addition address table entry in **the source and target node!**

SNVT Support

Part of the new SNET with LON driver version 1.5 is that the new SNVT list version 11 defined by LonMark® will be supported.

3. SFUP Update

A new library \$ 2.3.052 for PG5 1.1 and PG5 1.2 exists with all the new functionalities available from the support homepage www.sbc-support.ch

Contents of this library are:

- Alias binding (not visible in the F-Boxes)
- Polling mode (description see above)
- **New F-Boxes**

Actual available F-Box Libraries

LON Library	Capable for PG5...	Additional description
V 2.2.100 (delivered within SP 1.1.130)	PG5 1.1.xxx	Not usable for higher versions
\$2.3.052	PG5 1.1. (minimum version 130) PG5 1.2	Usable for both PG5 versions. (choose the PG5 version trough installing procedure).

Description of new F-Boxes

New Fbox	Stretchable	Input / Output	Use
SEND Generic Array	No	Register array [8] Given in by symbolic entry SND Pin	The SNVT is sent on a 0-1 transition on the SND pin. It is used on the generic SNVT and for all otherwise non supported SNVT
REC Generic Array	No	Register array [8] Given in by symbolic entry RCV Pin	At reception the RCV pin is set during one COB cycle. It is used on the generic SNVT and for all otherwise non supported SNVT
SEND Generic	Up to 8 Used SNVT size not countable!	Register 1..8 SND Pin	The SNVT is sent on a 0-1 transition on the SND pin. The send data is build out of the data from the used register. It is used on the generic SNVT and for all otherwise non supported SNVT
REC Generic	Up to 8 Used SNVT size not countable!	Register 1..8 RCV Pin	At reception the RCV pin is set during one COB cycle. The received data is stored in the used register It is used on the generic SNVT and for all otherwise non supported SNVT
SEND Message Reg	Up to 12 Message not countable!	R 1..12 SND Pin	Message sending on a 0-1 transition at the SND pin. Up to 50 characters are sent with length as set in SNET.
SEND Message DB+Txt	No	X: Textstring / DB Number Given in by symbolic entry SND Pin	Message sending on a 0-1 transition at the SND pin.
Poll SNVT	No	Poll Pin	Kick off of polling at linked receive F-boxes. Any linked received F-box including stretched F-boxes can be used.
LON Diag	No	Clear Pin	Modified version with more detailed information for diagnostic.
SEND / RCV Preset	No	Several in- or output information	Send or receive time information to control an actuator object.
SEND / RCV HVAC Override	No	Several in- or output information	To be used for heating, ventilation and air conditioning applications.

A NV-in and a NV-out may be defined to be polling / polled with 'poll' flag set in SNET.

4. Flash memory use for extended secure of LON binding information

For extended memory, if a Flash chip is required, instead of RAM chip, the program with all the LON binding information will be burned in flash and kept non volatile.

The procedure to change the RAM to Flash is as follows:

- 1 Bind the network variables by using RAM on all PCD systems where connections are required.
- 2 Restart the controller to load the binding information from Neuron into RAM.
- 3 Execute an upload dBx and rebuild (all) on the PCD systems which are involved.
- 4 Replace the RAM with Flash on the PCD system
- 5 Download the program again to load the dBx information into Flash.

For PCS1 or PCD2.M170 (with RAM and Flash memory space) the following steps are required:

- 1 Bind the network variables to the PCS1 controller (with a binding tool)
- 2 Restart the controller to load the binding information from the Neuron chip into RAM
- 3 Execute an upload dBx within the SNET.
- 4 After a mandatory rebuild a new download is required to load the dBx information into Flash. The automatic executed restart after a download process reloads the current information into RAM.

In the PCD2.M170 an alternative storage flash option is possible. This needs an upload of the dBx information before executing the storage command.

Note:

In PCD / and PCS1 systems the dBx information stored in **RAM** are always working during the normal controller operation process!

5. Main-Benefit

- The SNVT list (Standard Network Variable Types) by LonMark[®] version 11 is supported
- More compatibility through alias table and polling mode
- Project upgrade supported with the adaptation of firmware version within SNET and without to loose dBx information
- New F-Boxes for new functionalities and a higher capability with foreign nodes

This information gives you an overview of the current situation with LON communication.

If you have further questions about technical or distribution details please ask our responsible staff in pcd-support or our infrastructure-team.

Kind regards,

Rolf Nussbaumer
Building Controls