SBS Profibus and Profinet DP Interface User's Guide

with SB-5500 Series Controls

LL-5800 Rev 1.8 (GSD 6.1)

Productivity through Precision™

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User's Guide and Specifications

for

Decentralized Peripherals (DP) Interface Guide

for the

SBS Profibus and Profinet

For Use with Model SB-5500 Series Control Units

LL-5800

Revision 1.8 (GSD 6.1)

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Benefits of Profibus and Profinet

- Increases throughput by saving setup time.
- All-digital electronic design increases operating life and reliability.
- Easy to install and operate.
- Works with existing SBS installations.
- International adaptability and display language.
- Backed by world-class SBS customer service.

Table of Contents

Introduction

This guide provides the information needed to configure and to use the Profibus and Profinet interfaces of the SB-5500. It does not explain how to access the specific data fields once the data is in the Profibus master, Profinet master, or PLC, since this varies between masters.

To configure the Profibus or Profinet, first complete the following steps.

1. Connect the SB-5500 to the network cable.
2. Load the GSD or GSDML file into the master.
3. Enter the SB-5500 device station address.
4. Define the configuration of the SB-5500 in the master.
5. Define the input and output bytes and bits in the master.
6. Set parameters.

Note	This guide uses English language setup screens for one specific master as a reference. Your setup screens may vary in layout and language.

Profibus

Network Cable

The network cable is normally a nine-pin D-shell attached to one or two purple cables.

1. Plug the nine-pin D-shell into the nine-pin connector on the back of the SB-5500 labeled "Profibus."
2. Check the network cable termination. Each nine-pin D-shell connector typically has provisions in it for termination and a means to enable or disable the termination – typically, a switch.
3. If necessary, adjust the network cable termination.
4. Turn on termination for the Profibus device at the furthest end of the cable. That is, if the SB-5500 is added at one end by extending the network cable, enable termination for the new nine-pin D-shell.
5. Ensure that all other terminations are turned off. That is, ensure that the previous end nine-pin D-shell termination is disabled.

GSD File

The GSD file contains definitions that the masters require to interact with a piece of equipment. Each piece of equipment will have a unique GSD.

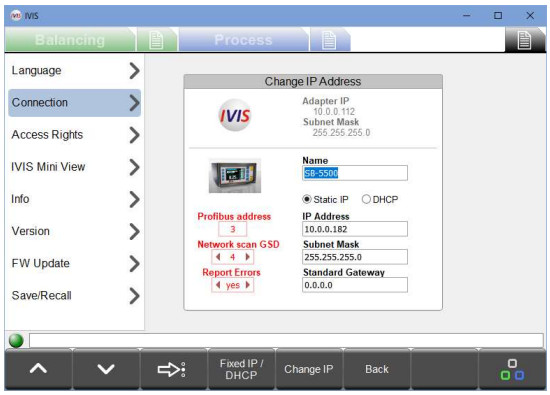
1. Download the Profibus GSD file for the SB-5500 from the SBS website at **https://accretechsbs.com/**.
2. Unzip the file. Two files are provided.
   a. The GSD file is named **SCH_0C7D.GSD**.
   b. The optional icon file is named **sbs.dib**. It is for masters that have a place for a company logo.
3. For more information about loading the GSD into the master, consult the reference manual for the master in use.

Setup and Station Address

The Profibus station address, error reporting, and GSD scan require setup. The settings are hidden when unavailable. For information about these, see "SBS Error Reporting", "Firmware update" and "Network Scan GSD."

Settings Without Control's Front Panel

Use the IVIS program from Accretech SBS, Inc. (refer to the IVIS manual for connection). On the General Settings tab (gray) select the Connection tab (on the left) and click **Change IP** to show the Profibus settings (in red). Make the changes and click **Change IP** to save them.



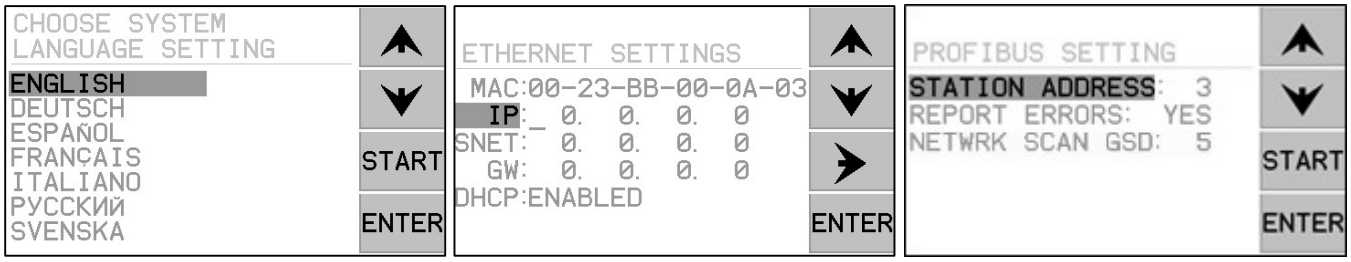
Settings with the Front Panel

The station address must be a unique address in the network to which the SB-5500 is connected. The address is entered in SB-5500 only during power up.

1. Connect the power and turn on the SB-5500. When the company logo screen appears, immediately press **Setup**.

Note While in Setup mode:

- Press **Enter** to save the settings on the screen or to proceed to the next Setup screen.
- Press **Cancel** to cancel unsaved settings on the screen or to proceed to the next screen.
- Press **Start** to cancel unsaved settings, exit Setup mode, and start operation.



2. To reach the Profibus Setting screen, press **Cancel**, **Cancel**.

Figure 1: Setup Screens

3. From the Profibus Setting screen, use the arrows to select the item to edit and press **Enter** to edit the item.
4. Use the **Up** and **Down** arrows to change the selection or digit. For a number, use the **Right** arrow to move to the next digit. Press **Cancel** to revert the setting. Press **Enter** to save and go to the next item.
5. When finished, press **Cancel** to begin normal controller operations.

Define Configuration

1. Inform the Profibus master about the configuration of the specific SB-5500 being connected to the network.
    a. To define the SB-5500, use the auto-scan device that the Profibus master has, if available. The auto-scan device can locate the SB-5500 and automatically get the station address and device card configuration.
    b. After using auto-scan, go to step 5.
    c. Otherwise, enter the station address and device card configuration manually as follows in steps 2 through 4.
2. Inform the Profibus master that there is a new SB-5500 connected to the network.
    a. Consult the reference guide for the master, as this process varies between masters.
    b. When the master used to develop the SB-5500 Profibus interface presents a list of devices, pick the new device from this list. The list is derived from the GSD files loaded in the “GSD File” section.
3. With the SB-5500 defined, enter the station address. Again, consult the reference guide, as this process varies between masters.
4. Enter the specific configuration of the device cards within the SB-5500.
    a. Consult the reference guide, as the method varies between masters. The master should present a list of modules derived from the GSD file.
    b. Select **Main** as the first module.

c. For each of the four card slots, starting with slot 1, select the appropriate module type as the next module. **Empty** must be selected for an unused slot. Modules must be selected for all four slots. If the controller has only three slots, **Empty** must be selected for slot 4.

Table 1: List of Possible Modules in SB-5500

For many cards there are multiple choices of modules. Changing to a newer module will give more features but will require more bytes and bits to be defined in the master. See "Define Input and Output Bytes and Bits in the Master."

Card modules introduced at GSD 1 or 2 will report errors as Diagnosis. To report the errors as Data, select the "wo Diag" version of the module. Newer card modules only report errors as Data.

Module Name	Octets out/in	GSD version at introduction – Description; ">" means "go to"
Main	1/1	1.0 - Control motherboard.
Mechanical Balancer	1/8	1.0 - Card for cabled mechanical balancers; errors > diagnosis field.
Mechanical Balancer wo Diag	1/11	3.0 - Card for cabled mechanical balancers; errors > data field.
Mechanical Balancer w Jobs	2/11	6.0 - Card for cabled mechanical balancers; errors > data field with jobs.
Non-Contact Balancer	1/8	1.0 - Card for non-contact mechanical balancers; errors > diagnosis field.
Non-Contact Balancer wo Diag	1/11	3.0 - Card for non-contact mechanical balancers; errors > data field.
Non-Contact Balancer w Jobs	2/11	6.0 - Card for non-contact mechanical balancers; errors > data field with jobs.
Manual Balancer	1/7	1.0 - Card for manual balance; errors > diagnosis field.
Manual Balancer wo Diag	1/10	3.0 - Card for manual balance; errors > data field.
Manual Balancer w Jobs	1/11	6.0 - Card for manual balance; errors > data field with jobs.
Hydrokompenser Balancer	2/8	1.0 - Card for Hydrokompenser balancer; errors > diagnosis field.
Hydrokompenser Balancer wo Diag	2/11	3.0 - Card for Hydrokompenser balancer; errors > data field.
AEMS	2/5	1.0 - Card for AEMS monitoring; errors > diagnosis field.
AEMS wo Diag	2/7	3.0 - Card for AEMS monitoring; errors > data field.
AEMS Zero	3/9	5.0 - Card for AEMS monitoring; errors > data field; set **Zero** (0) field.
EXACTDRESS	2/5	2.0 - Card for ExactDress monitoring; errors > diagnosis field.
EXACTDRESS wo Diag	2/7	3.0 - Card for ExactDress monitoring; errors > data field.
EXACTCONTROL	8/10	4.0 -Card for ExactControl process monitoring; errors > data field.
EXACTCONTROL w Ack	8/20	5.1 - Card for ExactControl process monitoring; errors > data field; job-executing status; continuous AEMS sensor data.
SB-5562 AE Control	8/20	6.1 - Card for Studer process monitoring; errors > data field; job-executing status; continuous AEMS sensor data.
Empty	0/0	1.0 - Empty card slot; no card installed.

Example Input Screens

Following are example English input screens for the master.

Slot	Idx	Module	Symbol	Type	I Addr.	I Len.	Type	O Addr.	O Len.
0	1	Main	Module1	IB	0	1	QB	0	1
1	1	Mechanic	Module2	IB	1	8	QB	1	1
2	1	Empty	Module3						
3	1	Empty	Module4						
4	1	Empty	Module5						

Example 1: Fully defined SB-5500 with one device card installed.

Slot	Idx	Module	Symbol	Type	I Addr.	I Len.	Type	O Addr.	O Len.
0	1	Main	Module1	IB	0	1	QB	0	1
1	1	Empty	Module2						
2	1	Non-Cont	Module3	IB	1	8	QB	1	1
3	1	Empty	Module4						
4	1	Mechanic	Module5	IB	9	8	QB	2	1

Example 2: Fully defined SB-5500 with two device cards.

5. Enter the specific meanings of the various bytes and bits for the I/O control points.

Note The GSD file does not contain the bit/byte meanings. They must be entered manually.

   a. Consult the reference guide, as the process varies between Profibus masters.

   b. From the input screen, select the byte offset or the bit offset.

   c. Enter the logic name.

   d. Enter the size of the field.

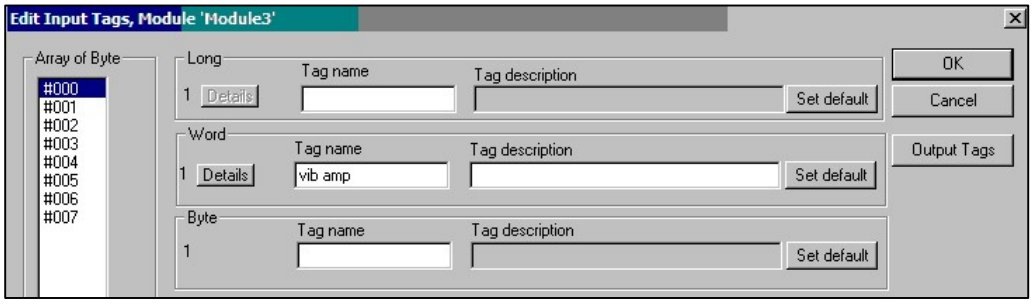
   e. Enter the byte swapping for 16-bit or 32-bit sized words.

Examples of Control Points Entry

The following examples show the various inputs and outputs for module 1 and module 3 from the previous examples, including both 16-bit words and bit definitions.

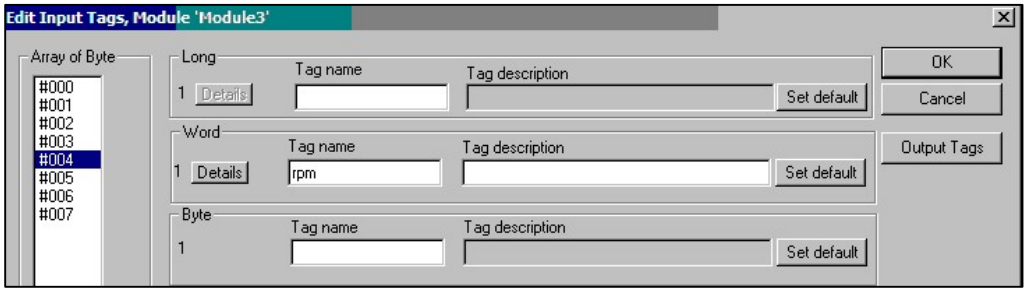
Example 3: Input for Main (Module 1)

Example 4: Output for Main (Module 1)

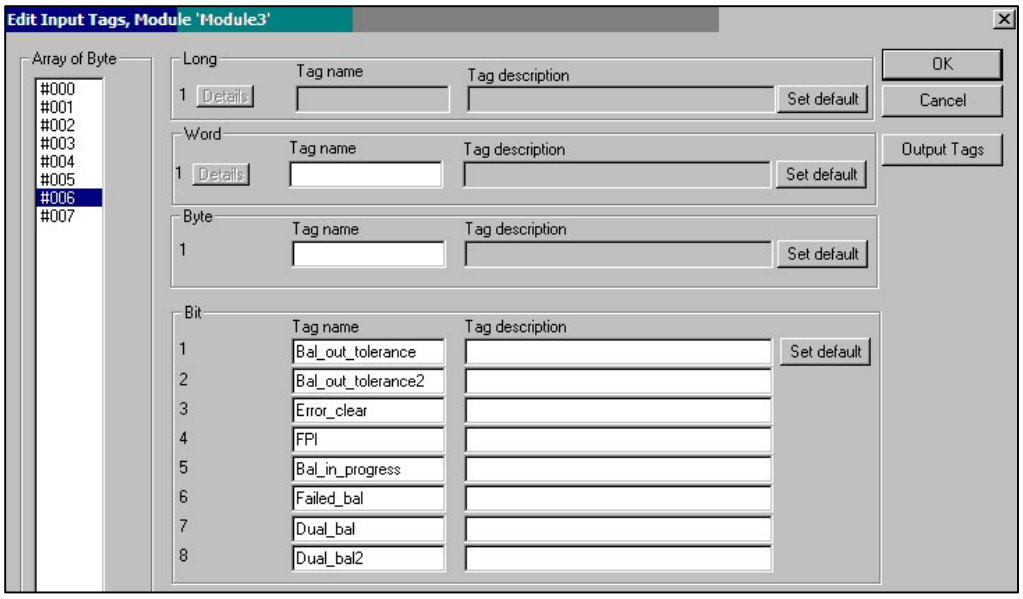


Example 5: Input for Module 3, Array 000

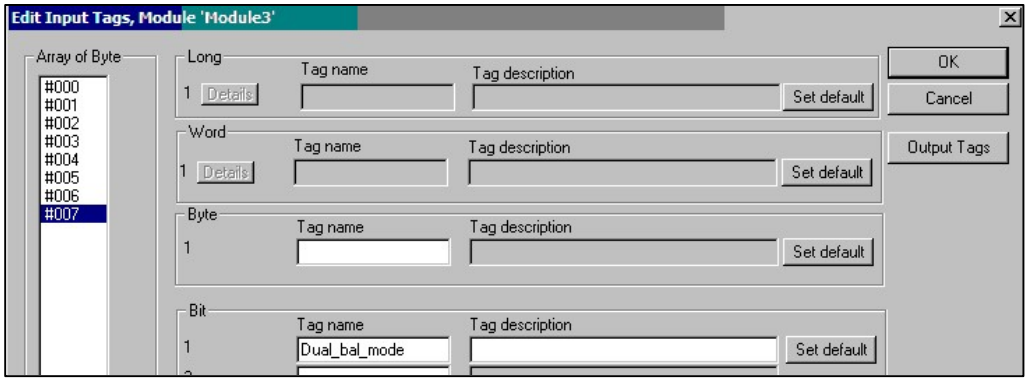
Example 6: Input for Module 3, Array 002



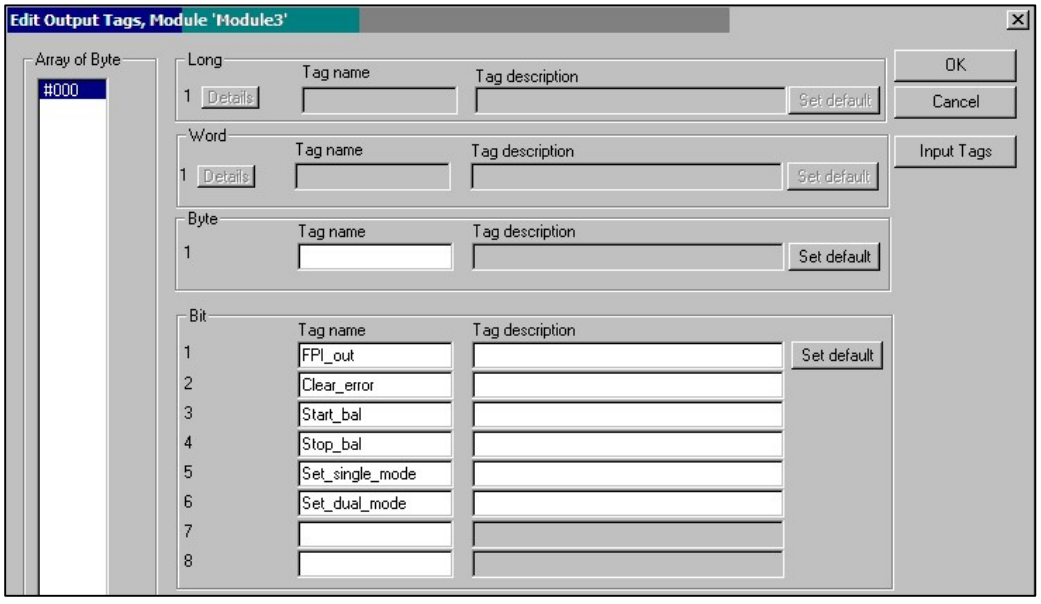
Example 7: Input for Module 3, Array 004



Example 8: Input for Module 3, Array 006



Example 9: Input for Module 3, Array 007



Example 10: Output for Module 3

Define Input and Output Bytes and Bits in the Master

This section explains how SB-5500 handles input and output control points with the many combinations of device cards that SB-5500 supports. It assumes a general knowledge of Profibus implementation. It does not cover the structure of the parameter list or diagnosis (error) list, since that is well documented by the GSD file. Output is defined as data from the Profibus master to SB-5500. Input is defined as data from SB-5500 to the Profibus master.

The SB-5500 has a few control points. Most of these control points are single-bit, yes/no type functions. Others, such as job number, require 8 bits (octet). Still others, such as RPM indication, require 16 bits (two octets). The various bit type control points are gathered together to form octets. To determine the specific location within an octet, see “Parameters.”

The device gathers all the octets for a specific device card into a contiguous group of octets. The system specifies the octet offset from the beginning of the group of octets. This holds true for input or output control points. For information about where the octet holding a specific control point is found in a group of octets, see “Parameters.”

The SB-5500 Profibus interface is a combined interface for a few Profibus modules. The controller Main is the base module supporting the separately installed device cards in device slots 1-4. Each module has its own number of input and output data octets.

The system collects each contiguous group of octets from each module into one large data field whenever the Profibus master requests input from the SB-5500. It sends all input data octets, even if the same data was sent previously. When the Profibus master wants to send data to one or more of the modules in an SB-5500, it will send all output data to all modules, even if the output data for a module has not changed. It sends all the various output data octets to the SB-5500 as one data field. Then, the SB-5500 separates this data field into a contiguous group of octets for each module. Finally, it sends each module a contiguous group of octets.

The SB-5500 merges all input data (input to Profibus master) and separates all output data (output from Profibus master) for each of the installed modules to or from the single data field, as needed. It does this based on the type of device card installed in each numbered device slot.

Data octets to and from Main are always first in the data field, followed by the data octets for Slot1, followed by the data octets for Slot2, followed by the data octets for Slot3, and followed by the data octets for Slot4. If one or more of the slots are empty, the data octets of the next installed slot will immediately follow the preceding octets. By determining the number of data octets each device card uses and the slot the device card is in, it determines the offset into the large data field. Some examples of SB-5500 with installed device cards follow.

Table 2: Output to SB-5500

Device Slot Number	Installed Module	Number of Octets Sent	Octet Positions in Data Field
Main	Main	1	0
1	Manual Balancer	1	1
2	Hydro Balancer	2	2, 3
3	(Empty)	-	-
4	AEMS	3	4-6

Table 3: Input from SB-5500

Device Slot Number	Installed Module	Number of Octets Sent	Octet Positions in Data Field

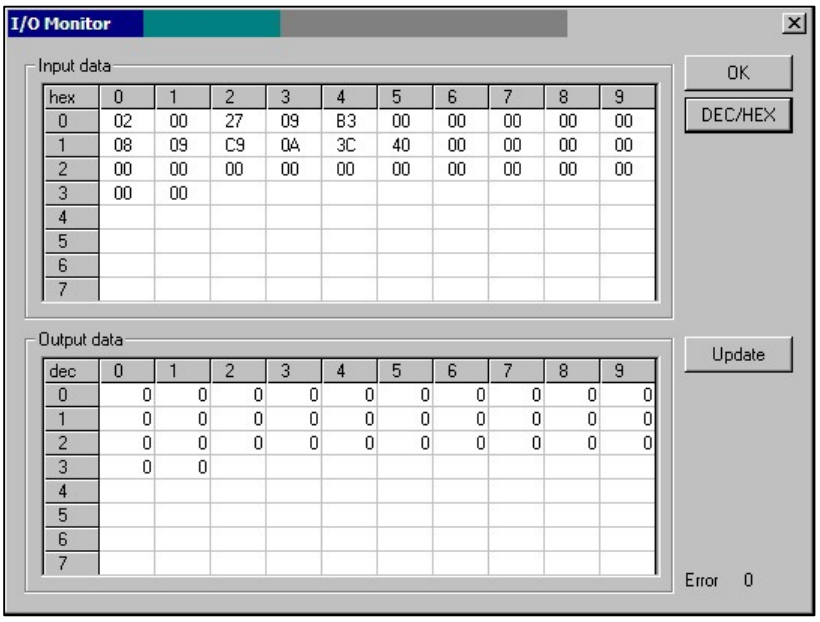
Main	Main	1	0
1	Hydro Balancer	11	1-11
2	(Empty)	-	-
3	Mechanical Balancer	11	12-22
4	Manual Balancer	11	23-33

Device Card Configurations

The following examples show how the various device cards are put together.

The next example is a general-purpose debugging screen that shows all the raw input bytes and output bytes from the SB-5500 in Example 2.

Note The example shows more data than is in the actual data transfers.



Example 11: Debugging screen

The following example shows the Main (module 1) input and output fully decoded. The offset is the actual byte offset from the start of the large data block described in Example 11. The large **I** at the beginning of each line denotes the inputs. The large **O** at the beginning of each line denotes the outputs.

Tag Name	Type	Offset	Value
I master fpi	Bit	0.0 Master Assignment	Off Good,non specific
I fp installed	Bit	0.1 Master Assignment	On Good,non specific
O fpi	Bit	0.0 Master Assignment	Off Good,non specific

Example 12: Decoded Main (Module 1) Input and Output

The following example shows module 3 input and output fully decoded. The offset is the actual byte offset from the start of the large data block describe in Example 11. The individual bits are defined as a byte (output) and a word (input), so the system will process them simultaneously.

Tag Name	Type	Offset	Value
I vib amp	16-bit unsigned integer (word)	1 Master Assignment	67 VT_UI2 Good,non specific
I vib phase	16-bit unsigned integer (word)	3 Master Assignment	752 VT_UI2 Good,non specific
I rpm	16-bit unsigned integer (word)	5 Master Assignment	0 VT_UI2 Good,non specific
I status	16-bit unsigned integer (word)	7 Master Assignment	1 VT_UI2 Good,non specific
O Output	8-bit unsigned integer (byte)	1 Master Assignment	0 VT_UI1 Good,non specific
	(2 Byte)		

Example 13: Decoded Module 3 Input and Output

The following example shows module 5 input and output fully decoded. The offset is the actual byte offset from the start of the large data block described in Example 11.

Tag Name	Type	Offset	Value
I vibration amplitude	16-bit unsigned integer (word)	9 Master Assignment	10 VT_UI2 Good,non specific
I vibration phase	16-bit unsigned integer (word)	11 Master Assignment	2289 VT_UI2 Good,non specific
I rpm	16-bit unsigned integer (word)	13 Master Assignment	2620 VT_UI2 Good,non specific
I bal out of tolerance	Bit	15.0 Master Assignment	Off Good,non specific
I bal out of tolerance 2	Bit	15.1 Master Assignment	Off Good,non specific
I error needs to be cleared	Bit	15.2 Master Assignment	Off Good,non specific
I front panel inhibit	Bit	15.3 Master Assignment	Off Good,non specific
I balance in progress	Bit	15.4 Master Assignment	Off Good,non specific
I failed balance	Bit	15.5 Master Assignment	Off Good,non specific
I dual balancing type 0	Bit	15.6 Master Assignment	On Good,non specific
I dual balancing type 1	Bit	15.7 Master Assignment	Off Good,non specific
I dual balancing mode	Bit	16.0 Master Assignment	Off Good,non specific
O Output	8-bit unsigned integer (byte)	2 Master Assignment	0 VT_UI1 Good,non specific
O fpi	Bit	2.0 Master Assignment	Off Good,non specific
O clear error	Bit	2.1 Master Assignment	Off Good,non specific
O start bal	Bit	2.2 Master Assignment	Off Good,non specific
O stop bal	Bit	2.3 Master Assignment	Off Good,non specific
O set single mode	Bit	2.4 Master Assignment	Off Good,non specific
O set dual mode	Bit	2.5 Master Assignment	Off Good,non specific

Example 14: Decoded Module 5 Input and Output

For a complete table of all SB-5500 Profibus parameters, outputs, inputs, and diagnoses (errors), see “Table 4: Profibus Parameters List.”

Set Parameters

Note Parameter are included for backward compatibility and are not included in GSD levels 3 and higher. Parameters are normally maintained in EEPROM and do not need to be preset by Profibus.

The GSD file supplies the setup parameters. The master in the following example presents a list from the GSD file of all the possible parameters for the current SB-5500 controller and device card combination.

1. For information about entering settings, consult the reference guide for the master, as this varies between masters.
2. Select a parameter.
3. From the list, select an option.
4. Click **OK**.
5. To enable the change to take effect in SB-5500, change the **Set** value to **Yes**. For example, Set Language value = Yes. This overrides the settings made from the **Main** menu available on the SB-5500 front panel or display unit.

6. To prevent a setting override, leave the default **Set** value in the GSD set to **No**.
7. Click **OK**. The system sends the parameters to the SB-5500 whenever an SB-5500 connects, an SB-5500 reconnects, or parameters change.

The following figure shows setting the language selection.

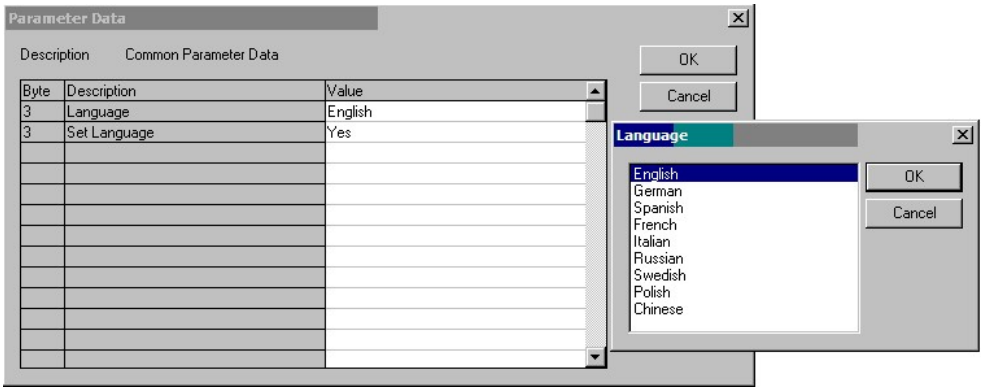


Figure 2: Setting the Language

The following figure shows setting the tolerance for balancing.

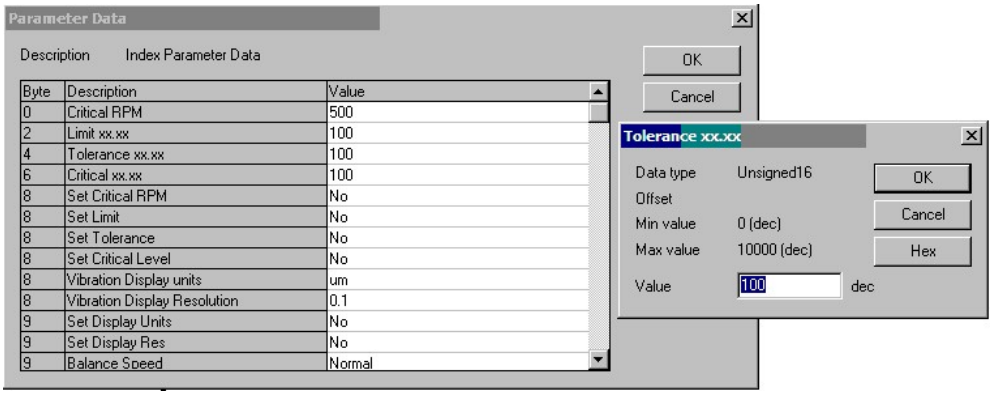


Figure 3: Setting the Tolerance

The following figure shows the other parameters that are available for balancing. Use the scrollbar to see these additional parameters.

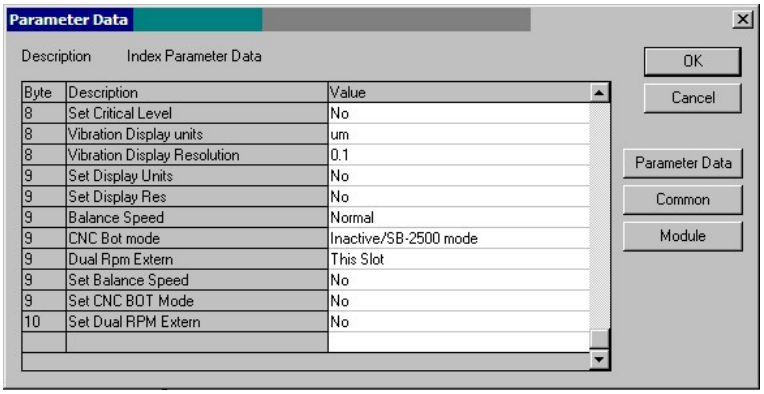


Figure 4: Additional Balancing Parameters

Parameters

The following table lists the SB-5500 Profibus parameters, outputs, inputs, and diagnoses (errors). Mechanical and non-contact balancers have identical Profibus interfaces, so they are grouped together. The octet position shown is the position offset for each individual module, starting with the first octet for that module in position 0. For example, the input from SB-5500 for mechanical and non-contact balancers show a total of eight octets (+0 to +7) with the first two octets for that module describing the vibration amplitude, the next two octets describing the vibration phase, etc.

Table 4: Profibus Parameters List

Module	Parameter	Outputs to SB-5500	Total Bits	Position		Inputs from SB-5500	Total Bits	Position		Diagnosis
				Octet[1]	Bit			Octet[1]	Bit	
Main	Language	Front Panel Inhibit	1	0	0	Front Panel Inhibited	1	0	0	
	Set Language (Y/N) [2]	Not used	3	0	1-3	Front Panel Installed	1	0	1	
						Not used	2	0	2-3	
		Slot 1 error disable [3]	1	0	4	Slot 1 error disabled [3]	1	0	4	
		Slot 2 error disable [3]	1	0	5	Slot 2 error disabled [3]	1	0	5	
		Slot 3 error disable [3]	1	0	6	Slot 3 error disabled [3]	1	0	6	
		Slot 4 error disable [3]	1	0	7	Slot 4 error disabled [3]	1	0	7	

[1] The octet position is this value added to the total number of octets used by the Main card plus all installed cards up to this card's slot number in the SB5500.

[2] The Set Parameters control update of each corresponding parameter value.
Set parameter=1 will force the corresponding parameter to be updated.
Set parameter=0 will leave the corresponding value unchanged from its current stored value.

[3] Available in 5510 firmware version 0.49 and later.

Module	Parameter	Outputs to SB-5500	Total Bits	Position Octet[1]	Position Bit	Inputs from SB-5500		Total Bits	Position Octet[1]	Position Bit	Diagnosis
Mech Balancer (SB-5512) card Non-Contact Balancer (SB-5532) add-D	Critical RPM	Front Panel Inhibit	1	+0	0	Vibration amplitude (0.01 microns)	H	8	0	0-7	A-P
							L	8	+1	0-7	
	Limit xx.xx	Clear the error	1	+0	1	Vibration phase (0.1 degree)	H	8	+2	0-7	
							L	8	+3	0-7	
	Tolerance xx.xx	Start Balance	1	+0	2	RPM	H	8	+4	0-7	
							L	8	+5	0-7	
	Critical xx.xx	Stop Balance	1	+0	3	Balance Out of Tolerance		1	+6	0	
	Set Critical RPM (Y/N) [2]	Set Single mode	1	+0	4	Balance Out of Tolerance 2		1	+6	1	
	Set Limit (Y/N) [2]	Set Dual mode	1	+0	5	Error needs to be cleared		1	+6	2	
	Set Tolerance (Y/N) [2]	Move weights to home position	1	+0	6	Front Panel Inhibited		1	+6	3	
	Set Critical Level (Y/N) [2]	Force Idle mode	1	+0	7	Balance In Progress		1	+6	4	
	Vib. Display Units	Job number [4]	4	+1	0-3	Failed Balance/ System Inoperative		1	+6	5	
	Vib. Display Resolution					Dual Balancing type		2	+6	6,7	
	Set Display Units (Y/N) [2]					Dual Balancing mode		1	+7	0	
	Set Display Res. (Y/N) [2]					Weights at home position		1	+7	1	
	Balance Speed (1-3)					Not Idle mode		1	+7	2	
	CNC BOT Mode					Job number [4]		4	+7	3-6	
	Dual RPM Extern.					Errors A-H [5]		8	+8	0-7	
	Set Balance Speed (Y/N) [2]					Errors I-P [5]		8	+9	0-7	
	Set CNC BOT Mode (Y/N) [2]					Errors Q-X [5]		8	+10	0-7	
	Set Dual RPM Extern. (Y/N) [2]										

[4] For balancer version 0.34 and later, and for GSD version 6.0 and later.

[5] For GSD version 3.0 and later, when the Without Diagnosis (**wo diag**) module version is in use, SB-5500 errors are not reported in the diagnosis field. Instead the data packet is expanded and SBS errors are reported using these additional data fields. (See "SBS Error Reporting.") Errors codes Q-X are reserved for future use.

Module	Parameter	Outputs to SB-5500	Total Bits	Position Octet[1]	Position Bit	Inputs from SB-5500		Total Bits	Position Octet[1]	Position Bit	Diagnosis
Hydro Balancer (SB-5518)	Critical RPM	Front Panel Inhibit	1	+0	0	Vibration amplitude (0.01 microns)	H	8	0	0-7	A-P
							L	8	+1	0-7	
	Limit xx.xx	Clear the error	1	+0	1	Vibration phase (0.1 degree)	H	8	+2	0-7	
							L	8	+3	0-7	
	Tolerance xx.xx	Start Balance	1	+0	2	RPM	H	8	+4	0-7	
							L	8	+5	0-7	
	Critical xx.xx	Stop Balance	1	+0	3	Balance Out of Tolerance		1	+6	0	
	Set Critical RPM (Y/N) [2]	Set Single mode	1	+0	4	Balance Out of Tolerance 2		1	+6	1	
	Set Limit (Y/N) [2]	Set Dual mode	1	+0	5	Error needs to be cleared		1	+6	2	
	Set Tolerance (Y/N) [2]	Balance direction	2	+0	6,7	Front Panel Inhibited		1	+6	3	
	Set Critical Level (Y/N) [2]	Set Balance direction [2]	1	+1	0	Balance In Progress		1	+6	4	
	Vib Display Units	Force Idle mode	1	+1	1	Failed Balance/ System Inoperative		1	+6	5	
	Vib Display Resolution	Job number [4]	4	+1	2-5	Dual Balancing type		2	+6	6,7	
	Set Display Units (Y/N) [2]					Dual Balancing mode		1	+7	0	
	Set Display Res. (Y/N) [2]					Balancing direction		2	+7	1,2	
	Balance Speed (1-3)					Not Idle mode		1	+7	3	
	CNC BOT Mode					Job number [4]		4	+7	4-7	
	Dual RPM Extern.					Errors A-H [5]		8	+8	0-7	
	Set Balance Speed (Y/N) [2]					Errors I-P [5]		8	+9	0-7	
	Set CNC BOT Mode (Y/N) [2]					Errors Q-X [5]		8	+10	0-7	
	Set Dual RPM Extern. (Y/N) [2]										

Module	Parameter	Outputs to SB-5500	Total Bits	Position Octet[1]	Position Bit	Inputs from SB-5500		Total Bits	Position Octet[1]	Position Bit	Diagnosis
Manual Balancer (SB-5543/SB-5544)	Critical RPM	Front Panel Inhibit	1	+0	0	Vibration amplitude (0.01 microns)	H	8	0	0-7	A-P
							L	8	+1	0-7	
	Limit xx.xx	Clear the error	1	+0	1	Vibration phase (0.1 degree)	H	8	+2	0-7	
							L	8	+3	0-7	
	Tolerance xx.xx	Force Idle mode	1	+0	2	RPM	H	8	+4	0-7	
							L	8	+5	0-7	
	Critical xx.xx	Job number [4]	4	+0	3-6	Balance Out of Tolerance		1	+6	0	
	Set Critical RPM (Y/N) [2]					Balance Out of Tolerance 2		1	+6	1	
	Set Limit (Y/N)					Error needs to be cleared		1	+6	2	
	Set Tolerance (Y/N) [2]					Front Panel Inhibited		1	+6	3	
	Set Critical Level (Y/N) [2]					Balance In Progress		1	+6	4	
	Vib. Display Units					Failed Balance/ System Inoperative		1	+6	5	
	Vib. Display Resolution					Not Idle mode		1	+6	6	
	Set Display Units (Y/N) [2]					Errors A-H [5]		8	+7	0-7	
	Set Display Res. (Y/N) [2]					Errors I-P [5]		8	+8	0-7	
						Errors Q-X [5]		8	+9	0-7	
						Job number [4]		4	+10	0-3	

Module	Parameter	Outputs to SB-5500	Total Bits	Position Octet[1]	Position Bit	Inputs from SB-5500		Total Bits	Position Octet[1]	Position Bit	Diagnosis
AEMS (SB-5522/SB-5522-6)		Job number	8	+0	0-7	Pressure level xxx.xx	H	8	0	0-7	A-G
							L	8	+1	0-7	
		Front Panel Inhibit	1	+1	0	Job number		8	+2	0-7	
		Clear the error	1	+1	1	Sensor number		3	+3	0-2	
		Reset Crash Latch	1	+1	2	Error needs to be cleared		1	+3	3	
		M1	1	+1	3	M1		1	+3	4	
		M2	1	+1	4	M2		1	+3	5	
		Start Continuous/ Start Learn	1	+1	5	Gap		1	+3	6	
		Stop/Cancel Learn	1	+1	6	Limit 1		1	+3	7	
		Set Zero Offset/ Next Learn	1	+1	7	Limit 2		1	+4	0	
		Clear Zero Offset/Save Learn	1	+2	0	Crash		1	+4	1	
		Force Idle mode	1	+2	1	Cycle running		1	+4	2	
		Normal Op = 0/ Learn = 1	1	+2	2	Front Panel Inhibited		1	+4	3	
						Not Idle mode		1	+4	4	
						Fluid sensor		1	+4	5	
						Job32 mode		1	+4	6	
						Learn Active [6]		1	+4	7	
						Errors A-H [5]		8	+5	0-7	
						Errors I-P [5]		8	+6	0-7	
						Zero Offset value	H	8	+7	0-7	
							L	8	+8	0-7	
ExactDress (SB-5523)		Dataset select	8	+0	0-7	Pressure level xxx.xx	H	8	0	0-7	A-I
							L	8	+1	0-7	
		Front Panel Inhibit	1	+1	0	Dataset #		8	+2	0-7	
		Clear the error	1	+1	1	Sensor #		3	+3	0-2	
		Reset crash latch	1	+1	2	Error needs to be cleared		1	+3	3	
		Not used	1	+1	3	Process running		1	+3	4	
		Data Teach	1	+1	4	Data Teach		1	+3	5	
		Start continuous	1	+1	5	Gap		1	+3	6	
		Stop	1	+1	6	Min.		1	+3	7	
		Start/Stop process	1	+1	7	Max.		1	+4	0	
						Crash		1	+4	1	
						Cycle running		1	+4	2	
						Front Panel Inhibited		1	+4	3	
						Errors A-H [5]		8	+5	0-7	
						Errors I-P [5]		8	+6	0-7	

[6] For GSD 6.0 and later, Learn Active bit requires firmware AEMS version 0.40 or later, ExactControl version 0.29 or later, and Studer AE Control version 0.29 or later.

Module	Parameter	Outputs to SB-5500	Total Bits	Position Octet[1]	Position Bit	Inputs from SB-5500	Total Bits	Position Octet[1]	Position Bit	Diagnosis
ExactControl (SB-5560/SB-5560-8) Studer AE Control (SB-5562)		Channel 1: Job Select	8	+0	0-7	Channel 1: Digital Outputs 1-8	1x8	+0	0-7	
		Channel 1: Start/Stop/Start Learn/Capture Learn	1	+1	0	Channel 1: Digital Outputs 9-14	1x6	+1	0-5	
		Channel 1: Teach/Cancel Learn	1	+1	1	Channel 1: Teach [7]	1	+1	6	
		Next Learn	1	+1	2	Channel 1: Infeed Enable	1	+1	7	
		Save Learn	1	+1	3	Channel 2: Digital Outputs 1-8	1x8	+2	0-7	
		Normal OP = 0/ Learn = 1	1	+1	4	Channel 2: Digital Outputs 9-14	1x6	+3	0-5	
		Channel 2: Job Select	8	+2	0-7	Channel 2: Teach [7]	1	+3	6	
		Channel 2: Start/Stop	1	+3	0	Channel 2: Infeed Enable	1	+3	7	
		Channel 2: Teach	1	+3	1	Channel 3: Digital Outputs 1-8	1x8	+4	0-7	
		Channel 3: Job Select	8	+4	0-7	Channel 3: Digital Outputs 9-14	1x6	+5	0-5	
		Channel 3: Start/Stop	1	+5	0	Channel 3: Teach [7]	1	+5	6	
		Channel 3: Teach	1	+5	1	Channel 3: Infeed Enable	1	+5	7	
		Channel 4: Job Select	8	+6	0-7	Channel 4: Digital Outputs 1-8	1x8	+6	0-7	
		Channel 4: Start/Stop	1	+7	0	Channel 4: Digital Outputs 9-14	1x6	+7	0-5	
		Channel 4: Teach	1	+7	1	Channel 4: Teach [7]	1	+7	6	
						Channel 4: Infeed Enable	1	+7	7	
						Errors A-H	8	+8	0-7	
						Errors I-P	8	+9	0-7	
						Channel 1: Executing Job [8]	8	+10	0-7	
						Channel 2: Executing Job [8]	8	+11	0-7	
						Channel 3: Executing Job [8]	8	+12	0-7	
						Channel 4: Executing Job [8]	8	+13	0-7	
						AEMS Channel 1 pressure level xxx.xx [9] H	8	+14	0-7	
						AEMS Channel 1 pressure level xxx.xx [9] L	8	+15	0-7	
						AEMS Channel 2 pressure level xxx.xx [9] H	8	+16	0-7	
						AEMS Channel 2 pressure level xxx.xx [9] L	8	+17	0-7	
						AEMS Channel 1 fluid sensor attached [9]	1	+18	0	
						AEMS Channel 2 fluid sensor attached [9]	1	+18	1	
						Learn Active [6]	1	+18	2	
						Future assignment [9]	6	+18	3-7	
						Future assignment [9]	8	+19	0-7	

[7] For GSD version 5.1 and later, Digital output bit 15 becomes the Teach status bit. A one (1) indicates Teach is active on at least one instance. A zero (0) indicates Teach is inactive.

[8] When a job is executing, the job number is placed in the channel's field. When the channel is idle, a zero (0) is placed in the field.

[9] GSD version 5.1 and later. ExactDress requires GSD version 2.0 and later. ExactControl requires GSD version 4.0 and later. Notes: AEMS Channel 1is used for AEMS Sensors 1, 3, 5, and 7. AEMS Channel 2 is used for AEMS Sensors 2, 4, 6, and 8.

Definitions of the Parameters

Table 5: Outputs to SB-5500

Output Parameter	Definition
Balance Direction (Hydrokompenser)	0,0 = Automatic always 0,1 = Automatic once 1,0 = Same 1,1 = Opposite
Cancel Learn	1 = Cancel the AE learn cycle. The 0 to 1 transition causes the action. The function of this output is valid only when Normal Op = 0. 0 = No operation.
Capture Learn	1 = Capture the background. The 0 to 1 transition causes the action. The function of this output is valid only during the monitor phase of the 5562 Learn cycle. 0 = No operation.
Channel x - Job Select (x = 1-4)	Job number. Valid values are 1 through the maximum as limited by card storage. Job 0 will select the last job displayed for edit.
Channel x - Start/Stop (x = 1-4)	1 = Start Teach or Process monitoring of the selected job. The 0 to1 transition causes the actual start. 0 = Stop process monitoring or data teach acquisition. The 1 to 0 transition causes the actual stop. For Channel 1, the function of this output is valid only when Normal Op = 0.
Channel x - Teach (x = 1-4)	1 = Teach mode active. 0 = Process monitoring mode active. For Channel 1, the function of this output is valid only when Normal Op = 0.
Clear the Error	1 = Clear the current error in slot. The 0 to1 transition causes the actual clearing. (See input bit "Error Needs to be Cleared.") 0 = No operation
Clear Zero Offset	1 = Clear the zero offset. The 0 to 1 transition causes the action. The function of this output is valid only when Normal Op = 0. 0 = No operation.
Data Teach	1 = Teach mode active. 0 = Process monitoring mode active.
Dataset Select	Same as job number. Valid values are 1 through 32.
Force Idle Mode	1 = Force the Idle mode. The 0 to 1 transition causes the actual forcing. 0 = No operation. (See input bit "Not Idle Mode.")
Front Panel Inhibit (Balancer, AEMS, ExactDress)	1 = Inhibit front panel activity for this slot. 0 = Front panel activity for this slot is not inhibited from this source. Any active Front Panel Inhibit source for a slot inhibits front panel activity. All Front Panel Inhibit sources for a slot must be inactive to allow activity on the panel. This signal is only one of four Front Panel Inhibit sources for any slot.

Output Parameter	Definition
Front Panel Inhibit (Main)	1 = Inhibit front panel activity on all slots. 0 = Front panel activity is not inhibited from this source. Any active Front Panel Inhibit source for a slot may inhibit front panel activity. All Front Panel Inhibit sources for a slot must be inactive to allow activity on the panel. This signal is only one of four Front Panel Inhibit sources for any slot.
Job # (AEMS)	Values of 1 through 16 represent job numbers and will immediately set the job (1 through 32 in 32 Job mode). Ignores other values.
Job # (Balancer)	Values of 1 through 8 represent job numbers and will immediately set the job. Ignores other values.
Learn Active (AEMS, ExactControl)	1 = learn state active 0 = learn state inactive
M1	1 = Change to M1 mode. The 0 to 1 transition causes the actual change. 0 = No operation.
M2	1 = Change to M2 mode. The 0 to 1 transition causes the actual change. 0 = No operation.
Move Weights to Home Position	1 = Start the cycle that moves the weights to the home position. The 0 to 1 transition starts the cycle. Only valid with Home sensors in a non-contact balancer. 0 = No operation.
Next Learn	1 = Advance to the next phase of the learn cycle. The 0 to 1 transition causes the action. The function of this output is valid only when Normal Op = 0. 0 = No operation.
Normal Op = 0/ Learn = 1	1 = Learn. Start Learn, Cancel Learn, Next Learn, and Save Learn are enabled. Start Continuous and Stop are disabled. 0 = Normal Op. Start Continuous and Stop are enabled. Start Learn, Cancel Learn, Next Learn, and Save Learn are disabled.
Reset Crash Latch	1 = Clear the crash latch. The 0 to 1 transition causes the actual reset. 0 = No operation.
Save Learn	1 = Save the results of the learn cycle. The 0 to 1 transition causes the action. The function of this output is valid only when Normal Op = 0. 0 = No operation.
Set Balance Direction	1 = Turn on balance direction as set in Set Balance Direction Command. The 0 to 1 transition causes the actual direction change. 0 = Turn off balance direction.
Set Dual Mode	1 = Change slot operation to dual balance head operation. The 0 to 1 transition causes the actual change. 0 = No operation.
Set Single Mode	1 = Change slot operation to single balance head operation. The 0 to 1 transition causes the actual change. 0 = No operation.

Output Parameter	Definition
Set Zero Offset	1 = Set the present level as zero (0). The 0 to 1 transition causes the action. The function of this output is valid only when Normal Op = 0. 0 = No operation.
Slot x Error Disable (x=1, 2, 3, or 4)	1 = Prevent any errors from the specified slot from passing to the bus master. Sends a Diagnosis Clear message to the bus master to clear any errors currently registered within the bus master for the specified slot. Any error conditions functions as normal within the controller and slot card. 0 = Allows all errors from the specified slot card to pass to the bus master. Any errors generated within the slot card while this disable bit is set will not pass to the bus master. Only new errors will pass to the bus master.
Start Balance	1 = Start a balance cycle. The 0 to 1 transition causes the actual balance cycle. 0 = No operation.
Start Continuous (AEMS, ExactDress)	1 = Start continuous plotting and transmission of acoustical data. The 0 to 1 transition causes the actual start. For AEMS, the function of this output is valid only when Normal Op = 0. 0 = No operation.
Start Learn	1 = Start the AE learn cycle. The 0 to 1 transition causes the action. The function of this output is valid only when Normal Op = 0. 0 = No operation.
Start/Stop Process	1 = Start process monitoring or data teach acquisition, per status of data teach. The 0 to1 transition causes the actual start. 0 = Stop process monitoring or data teach acquisition. The 1 to 0 transition causes the actual stop.
Stop (AEMS, ExactDress)	1 = Stop plotting and transmission of acoustical data. The 0 to 1 transition causes the actual stop. For AEMS, the function of this output is valid only when Normal Op = 0. 0 = No operation.
Stop Balance	1 = Abort a balance cycle in progress. The 0 to 1 transition causes the actual abort. 0 = No operation.

Table 6: Inputs from SB-5500

Input Parameter	Definition
AEMS Ch x fluid sensor attached (x = 1-2)	1 = Fluid sensor attached to this sensor. 0 = Fluid sensor is not attached to this sensor or the job is not executing.
Balance in Progress	When this bit is set, an automatic balance cycle is in progress.
Balance Out of Tolerance	This bit becomes 1 when the sensed vibration level exceeds the operator-defined Tolerance level. The CNC BOT MODE setting determines the function of this bit during an automatic balance cycle.
Balance Out of Tolerance2	The bit become 1 when the sensed vibration level exceeds the operator-defined Critical Tolerance or when the spindle RPM exceeds the operator-defined Critical RPM. The CNC BOT MODE setting determines the function of this bit during an automatic balance cycle.
Balancing Direction (Hydro only)	0,0 = Automatic always 0,1 = Automatic once 1,0 = Same 1,1 = Opposite
Channel x Digital Outputs 1-14 (x = 1-4)	1 = The indicated digital output is active. 0 = The indicated digital output is inactive.
Channel x Executing Job (x = 1-4)	0 = No job executing on this channel. Else, the job number of the job that is executing.
Channel x Infeed Enable (x = 1-4)	1 = The channel is running a job. (OK to run the job cycle). 0 = The channel is not running a job. There may be an error.
Channel x Teach (x = 1-4)	1 = The channel is operating in Teach mode. 0 = The channel is not operating in Teach mode.
Crash	This bit is 1 when the actual acoustical energy level is above the operator-defined **Crash** value for the current job.
Cycle Running	This bit is 1 when the system is graphing and transmitting acoustical energy.
Data Teach	1 = Data Teach mode is active. 0 = Process monitoring mode active.
Dataset #	Current job number.
Dual Balancing Mode	0 = Single 1 = Dual
Dual Balancing Type	0,0 = Single 0,1 = Dual plane 1,0 = Dual spindle (not supported)
Error Needs to be Cleared	When this bit is set, an error has occurred and needs to be serviced or cleared. Clear it by setting the "Clear the Error" bit in Outputs to SB-5500.
Errors (A-X)	These bits indicate individual errors. To match error bits to the error description, the operation guide for that card.
Failed Balance/System Inoperative	This bit is 1 when an automatic balance cycle fails or the system is inoperative because of an error condition.

Input Parameter	Definition
Fluid Sensor	1 = Fluid sensor attached to this sensor. 0 = Fluid sensor is not attached to this sensor or the job is not executing.
Front Panel Inhibited (Main)	1 = Front panel is inhibited for all slots. 0 = Front panel active for all slots. **Note**: Individual slot front panel inhibits may still be active.
Front Panel Inhibited (Slot Cards)	This bit indicates the current setting of the CNC-interface FPI bit. When this bit is set, key operator actions at the front panel are disallowed. Disables the **Menu**, **Man.**, and **Auto** buttons. The **Power** and **Cancel** buttons are enabled still. Use them to stop an automatic balance operation. Allows access to the **Show-All** button and System Status screen.
Front Panel Installed	1 = Front panel assembly is connected to SB5500 controller. 0 = No front panel assembly connected.
Gap	This bit is 1 when the actual acoustical energy level is above the operator-defined **Gap** value for the current job.
Job # (AEMS)	The current job number. 0 = Off 1-16 = Job number 1 to 16. (1 through 32 in 32-job mode.)
Job # (Balancer)	The current job number. 0 = Off 1-16 = Job number 1 to 16.
Job 32 Mode	1 = 32-job mode. Valid jobs are 1-32. M1 and M2 do not select the mode. 0 = 16-job mode. Valid jobs are 1-16. M1 and M2 select the alternates.
Limit 1	This bit is 1 when the actual acoustical energy level is above the operator-defined **Limit 1** value for the current job.
Limit 2	This bit is 1 when the actual acoustical energy level is above the operator-defined **Limit 2** value for the current job.
M1	This bit is 1 when the **Monitoring parameter set 1** is the current setting.
M2	This bit is 1 when the **Monitoring parameter set 2** is the current setting.
Max	1 = Error: The AE signal exceeds the level of the Process Maximum Limit setting (excessive dress pressure). 0 = No error.
Min	1 = Error: The results of the current dress process fall below the zone minimum limit set. Indicates that some active process zones have produced AE signal levels that are lower than the corresponding zone dataset master. 0 = No error.
Not Idle Mode	1 = Not Idle. In this state, the Profibus interface cannot initiate some functions. See output bit "Force Idle Mode." 0 = Idle. Profibus can initiate functions.
Pressure Level Hi (H) and Low (L)	The actual acoustical energy level in units on 0.01 dynes. The 2 bytes that make up this field are in big-endian format. Compute the total 16-bit value as 256*label-Hi + label-Low. (Hi stands for high.)

Input Parameter	Definition
Process running	1 = The process is running. 0 = The process has stopped.
RPM Hi (H) and Low (L)	The actual RPM. The 2 bytes that make up this field are in big-endian format. Compute the total 16-bit value as 256*label-Hi + label-Low. (Hi stands for high.)
Sensor #	The currently monitored sensor.
Slot x Error Disable (x=1,2,3 or 4)	1 = Prevent any errors from the specified slot from passing to the bus master. 1 = Slot x errors are disabled. 0 = Slot x errors are enabled. Send a Diagnosis Clear message to the bus master to clear any errors currently registered in the bus master for the specified slot. Any error conditions continue to function as normal within the controller and slot card. 0 = Allows all errors from the specified slot card to pass to the bus master. Any errors generated within the slot card while this disable bit is set will not pass to the bus master. Only new errors will pass to the bus master.
Vibration Amplitude Hi (H) and Low (L)	The actual vibration amplitude in units on 0.01 microns. The 2 bytes that make up this field are in big-endian format. Compute the total 16-bit value as 256*label-Hi + label-Low. (Hi stands for high.)
Vibration phase Hi (H) and Low (L)	The actual vibration phase in units on 0.1 degrees. The 2 bytes that make up this field are in big-endian format. Compute the total 16-bit value as 256*label-Hi + label-Low. (Hi stands for high.)
Zero Offset Value Hi (H) and Low (L)	The actual acoustical energy level in units on 0.01 dynes. The 2 bytes that make up this field are in big-endian format. Compute the total 16-bit value as 256*label-Hi + label-Low. (Hi stands for high.)

SBS Error Reporting

The SBS card module reported errors use letter codes A through L. **Internal Voltage Error** (no letter code) is an error that originates from the Main module and indicates an internal power form failure in the control. The system always reports this error to the diagnosis field. For more information about each error code, see the operation manual.

Error Reporting Options: Diagnosis Field or Data Field

Each card configuration module introduced prior to GSD revision 3.0 will place the errors into the Diagnosis Fields. Starting with GSD revision 3.0, selection of a newer modules for the card will places errors into the Data Fields instead. The first of these newer modules have **wo diag** as a suffix for its name. Cards introduced after GSD revision 3 only place errors in the Data Fields.

Network Scan GSD

Selection of configuration modules can be performed manually, but the master can also choose the modules automatically using Network Scan. For Network Scan, the SB-5500 sends a GSD Scan Number to the master. The Scan Number sets the highest GSD level to be used for any module in the GSD file. The Scan Number can be in a range defined by the installed cards. The minimum is the largest introductory GSD level of all **cards** installed. The maximum is the largest introductory level of all **modules** of cards installed.

The **Network Scan GSD** setting is found on the Profibus Setup screen on the Front Panel or on the Change IP tab of IVIS. Edit it to set the maximum GSD level module to be chosen for the cards. Factory default is the smallest of the range of values. With Profinet, the highest value will be used and cannot be edited.

For example, a control has two cards with modules at introductory GSD levels of (1, 3, and 5) and (2 and 3) respectively. The largest of (1 and 2) is 2. The largest of (5 and 3) is 5. Therefore, the range of Scan Numbers can be from 2 to 5. Factory default is the smallest, 2. If 2 is entered, then the Network Scan will choose modules introduced at GSD levels of (1) and (2). If 3 or 4 is entered, then the Network Scan will choose modules introduced at GSD levels of (3) and (3). If 5 is entered, then the Network Scan will choose modules introduced at GSD levels of (5) and (3).

Firmware update

When manually configuring the master, if a device card's firmware is not current enough to support a newer GSD level (e.g. "wo Diag" with old firmware), then the configuration will fail when the master attempts to verify the configuration selections with the SB-5500. To resolve this issue, go to **https://accretechsbs.com/** to get the latest firmware and follow instructions in the zip file.

Report errors

As soon as the master initiates the Profibus interface, then a module of GSD level 1 or 2 can send errors as Diagnosis Data. After the master sends the first output packet, then its **Slot X Error Disable** control bits control whether the Diagnosis Data can be sent to the master (see "Parameters").

The **Report Errors** setting is found on the Profibus Setup screen on the Front Panel or on the Change IP tab of IVIS. Edit it to control the cards ability to send Diagnosis Data before the master sends the first output packet. **Yes** allow the cards to send Diagnosis Data prior to the master's first output packet. **No** prevents the Diagnosis Data prior to the first output packet..

Application Notes

Profibus Byte and Word Addresses for the Siemens S7 and SB-5500

The SB-5500 Profibus packets contain both byte (8-bit size) and word (16-bit size) variables and data. The position and number of data elements varies depending on what function cards are plugged in. This means that the word variables may be on odd memory addresses or on even memory addresses. This may be a problem for some Profibus controllers.

The 16-bit values are in big-endian format, meaning that the high order byte is the first byte in the list. SBS has labeled the 16-bit values as two-byte values with the first byte suffix of high (H or Hi) and the second byte suffix of low (L or Low). If a 16-bit value cannot be directly accessed on the odd or even boundary, then the 16-bit value can be calculated as: *LABEL_Low + (256 times LABEL_.Hi)*.

Profibus and LCD Interaction

Usually, the user controlling the SB-5500 over Profibus looks at the results from the changes with Profibus, not on the LCD. Commands and parameters that the system sends over Profibus and that change settings in the SB-5500 do not cause the LCD screen to change. For the screen to reflect the change, the user must change to another screen and then return to the previous screen. After doing this, the Profibus changes are visible.

Profibus Master Reporting Errors A and J While the Spindle is Stopped

Interpretation of SBS error codes A and J are both timing and RPM dependent. The SB-5500 reports these errors any time the RPM signal is not present (error J), or when the RPM signal is present but is either below

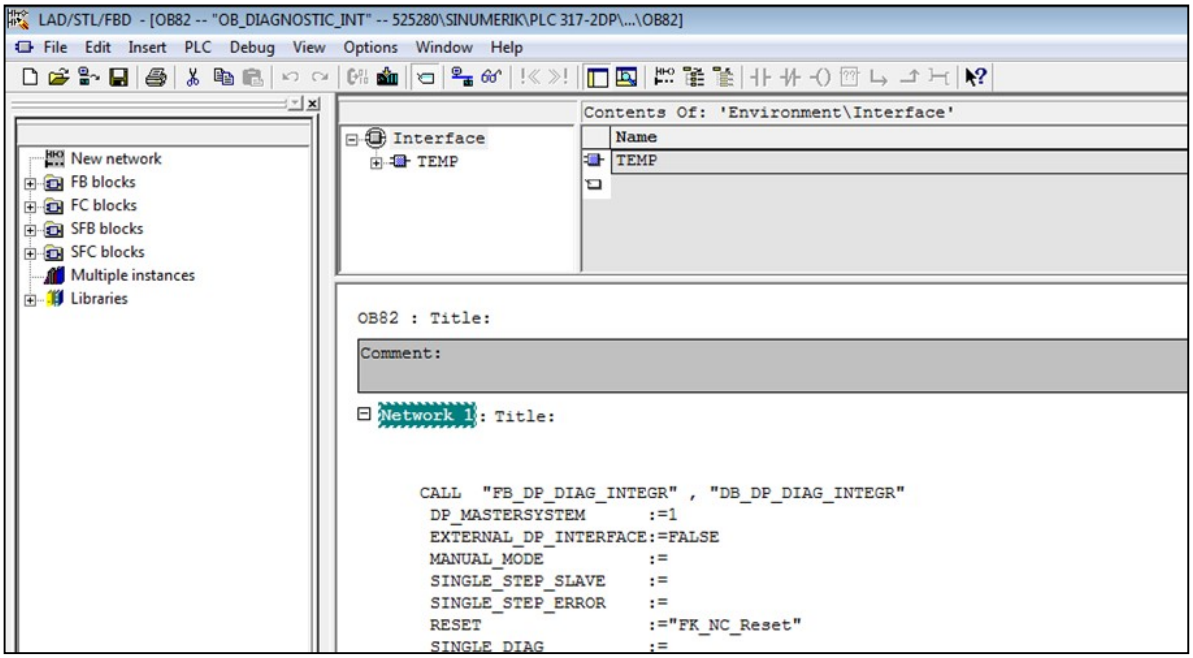
300 RPM or above 30,000 RPM (error A). SB-55500 does not know whether the lack of RPM is intended and valid (stopped spindle), so it always reports the status of RPM using these error codes. The Profibus master or PLC must interpret these errors since they can determine whether the spindle is rotating.

Errors Sent by Diagnosis Messages

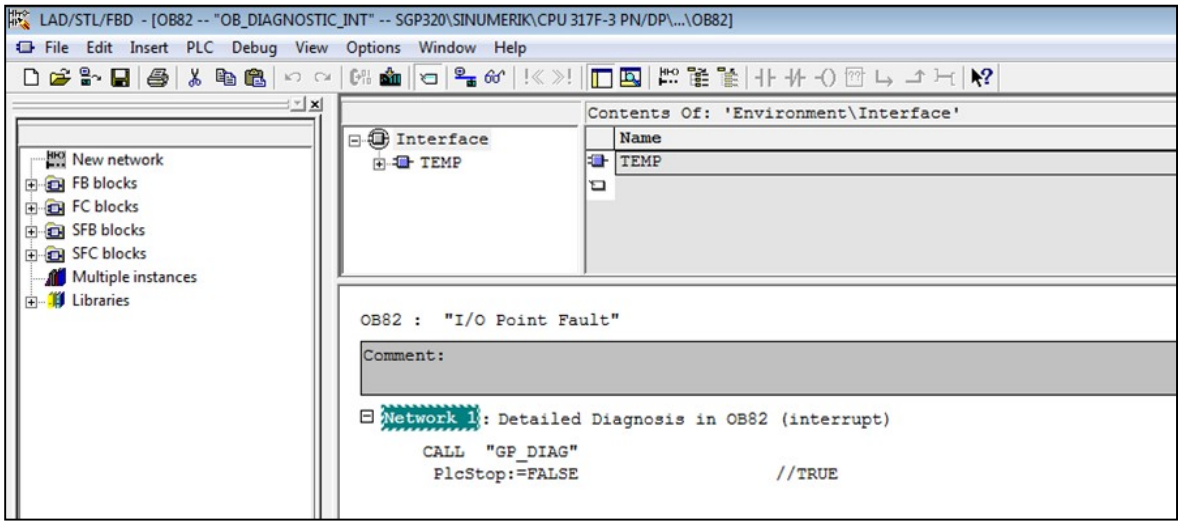
If a Sinumerik system has **Safety Integrated Features** or **SF** running, this causes the CNC to go into **Stop** mode and display **SF** when it sees SBS error signals. The feature is active by default in later versions of Siemens code.

To prevent the Siemens PLC from going into **Stop** mode and displaying **SF** when SBS sends a diagnosis message by Profibus, do one of the following:

1. Use GSD file version 3.0 or later, and then select module types with the **wo diag** option, which removes SBS error reporting from the diagnosis field and instead sends errors as part of the regular data packet.
2. Use the **Report Errors** setting on the Profibus Setup screen to prevent SB-5500 from sending errors from power on of the SBS control until the master sends the first output packet. For more information, see "SBS Error Reporting."
3. (Not Recommended) Disable the Sinumerik **Safety Integrated Features** or **SF** by changing the **OB82** setting on the Sinumerik control as follows.
    a. OB82 Version 1.0 Set EXTERNAL_DP_INTERFACE:= FALSE



b. OB82 Version 1.0 Set PlcStop:=FALSE



Profinet

Profinet Configuration

Accretech SBS, Inc. controllers incorporate a device to make the conversion from Profinet to Profibus. They are designed to have a variety of slot cards installed. There is not a generic GSDML file that can be used to associate the machine tool's Profinet interface with an unspecified selection of slot cards. The slot card configuration for a SBS controller requires the generation of a corresponding Profinet GSDML file. The following procedure uses the SBS controller with its slot cards and the SBS Profibus GSD file to produce a GSDML file for its slot card configuration. The resulting GSDML file is used to associate the machine tool's Profinet interface with that SBS controller.

The following information is specific to Accretech SBS, Inc. customers. For more information about installing Hilscher netLINK, see the netLINK NL 51N-DPL Installation and Hardware Description User Manual. For more information about configuring netLINK, see the netTAP, netBRICK and netLINK Configuration of Gateway and Proxy Devices Operating Instruction Manual. For more information about netLINK proxies, see the netLINK PROXY Podcast - Commissioning and netLINK PROXY Podcast - Multiple Proxies in single PROFINET segment videos.

Install Configuration Software

The SBS Profinet device uses Gateway Solutions software needed for configuring Profinet.

1. Go to www.hilscher.com/support/downloads.
2. Click **Gateway Solutions DVD**.
3. Select **Save** to download the file.
4. Navigate to the default **Download** folder.
5. Extract the contents of the Zip file to a folder named **Gateway Solutions DVD**.
6. From the **Gateway Solutions DVD** folder, double-click **Gateway_Solutions.exe**.

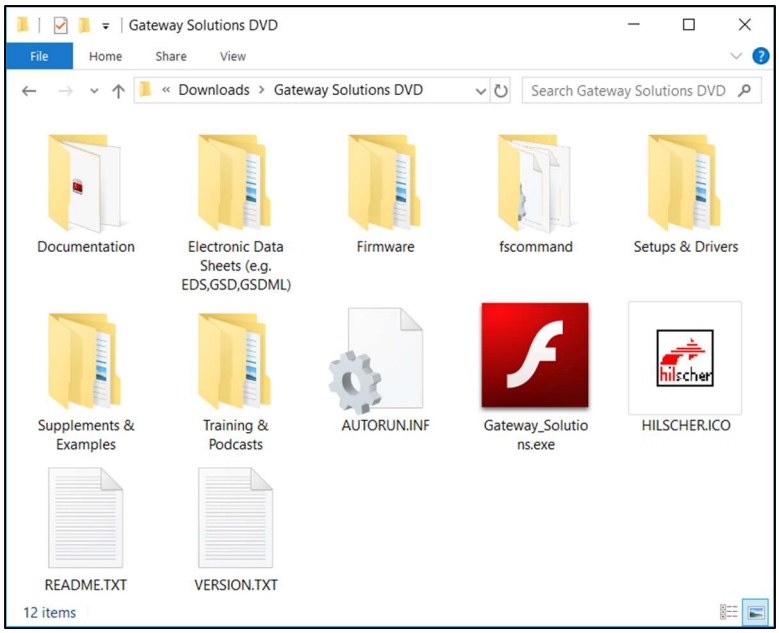


Figure 5: Gateway Solutions Icon

7. From the Gateway Solutions Startup window, click **Install Configuration and Diagnostic Software**.

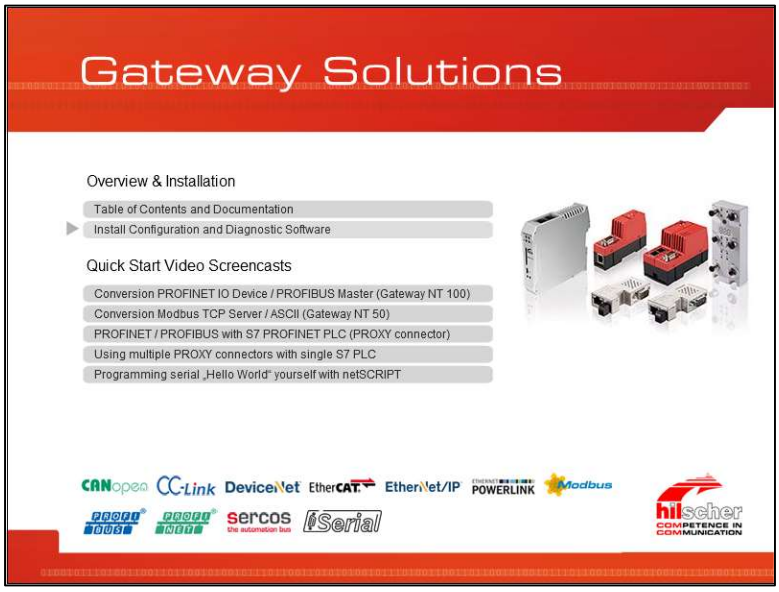


Figure 6: Gateway Solutions Startup Window

8. If a User Account Control message appears, click **Yes**.
9. From the Gateway Solutions install options, do the following:
    a. Select **Configuration Software SYCON.net**.
    b. Click **Execute**.

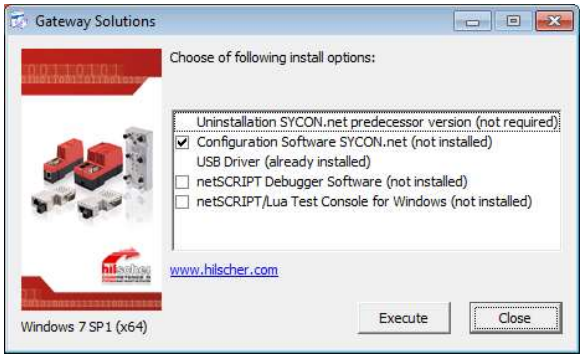


Figure 7: Gateway Solutions Install Options

Ethernet Device Setup

After attaching the ethernet cable to SBS and PLC, run the Ethernet Device Setup program.

1. From the **Start** menu, navigate to **Ethernet Device Setup** in the **SYCON.net System Configurator** folder.
2. Double-click **Ethernet Device Setup**.

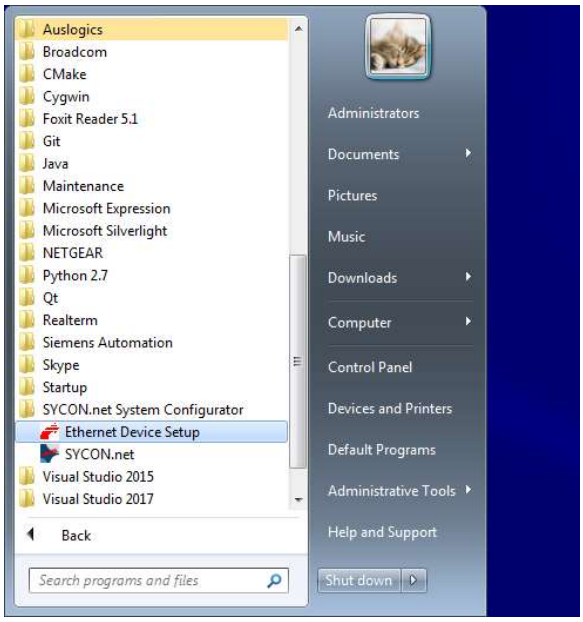


Figure 8: Ethernet Device Setup in Start Menu

3. From the Ethernet Device Configuration window, click **Search Devices**.

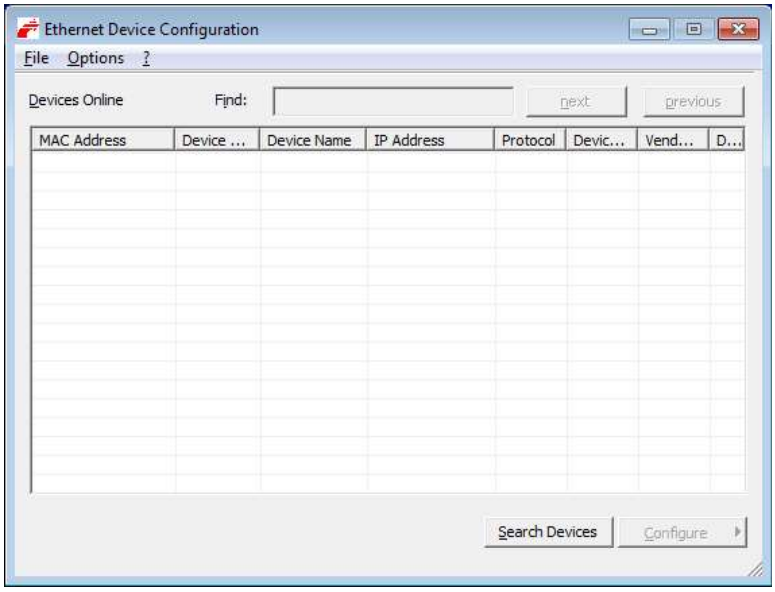


Figure 9: Search Devices from Ethernet Device Configuration Window

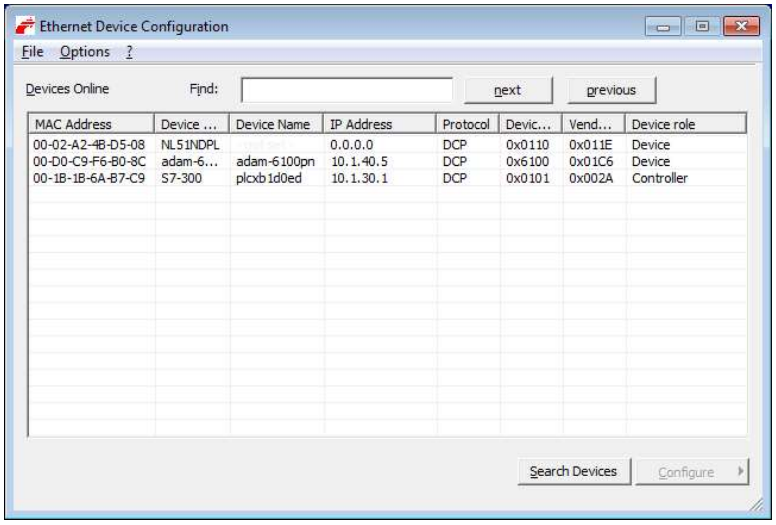


Figure 10: After Searching Devices, the Devices Online Appear

Set IP Address

1. From the Ethernet Device Configuration window, select the row with **Device Type NL51NDPL**.
2. Right-click the row to view the options.
3. Select **Set IP Address**.

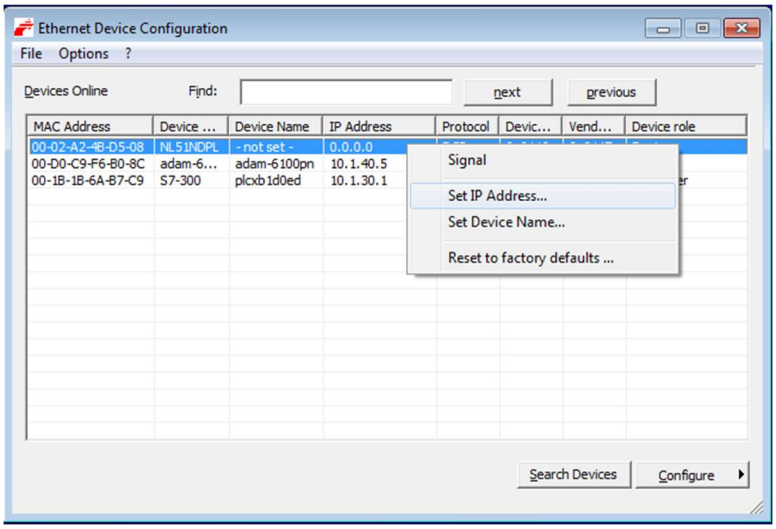


Figure 11: Select Set IP Address

4. From the IP Configuration window, do the following:
    a. Set the **IP address**.
    b. Set the **Subnet mask** for the network.
    c. Click **OK**.

Figure 12: IP Configuration Window

Set SYCON Password

Set an administrator password the first time SYCON.net starts.

1. From the **Start** menu, navigate to **SYCON.net** in the **SYCON.net System Configurator** folder.
2. Double-click **SYCON.net**. (For more information see Figure 8.)
3. From the SYCON.net User Login window, do the following:
    a. In **Password**, type a password for the **Administrator**.
    b. In **Confirm password**, repeat the same password.
    c. Click **OK**.

Figure 13: SYCON.net User Login

Import Device Description

1. From the SYCON.net window, select the **Network** menu.
2. From the **Network** menu, select **Import Device Descriptions**.

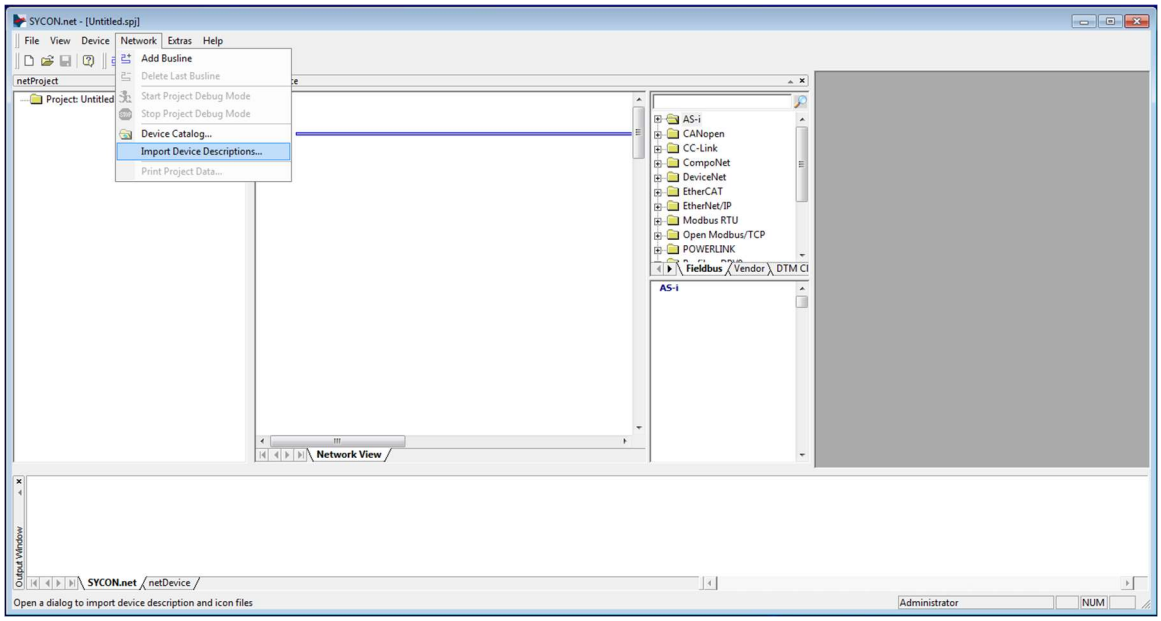


Figure 14: Import Device Descriptions Option on the Network Menu

3. From the Import Device Description window, do the following:
   a. Navigate to the GSD file.
   b. Select the **GSD** file.
   c. Click **Open**.

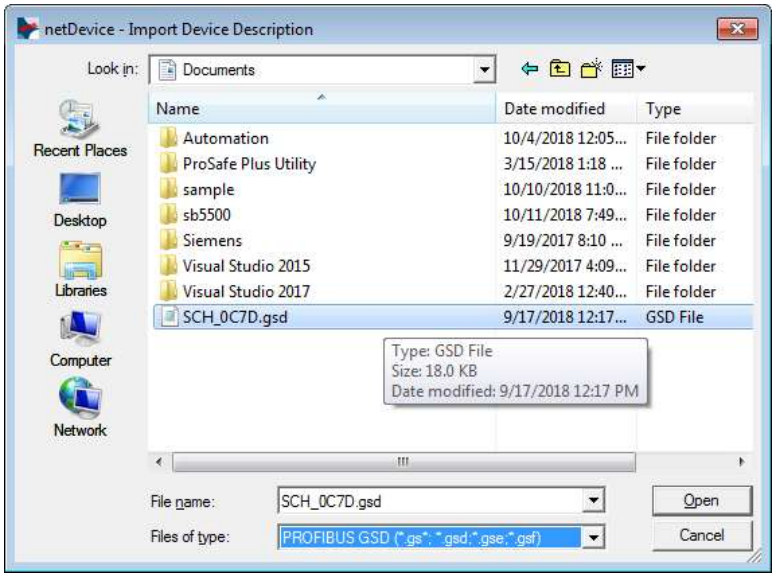


Figure 15: Import Device Description Window

Add NetLINK

1. From the SYCON.net window, click the **Vendor** tab.
2. From the **Vendor** tab, select the **Hilscher GmbH** folder and then the **Gateway / Stand-Alone Slave** folder.
3. From the **Gateway / Stand-Alone Slave** folder, scroll to **NL 51N-DPL**.
4. Select **NL 51N-DPL**.

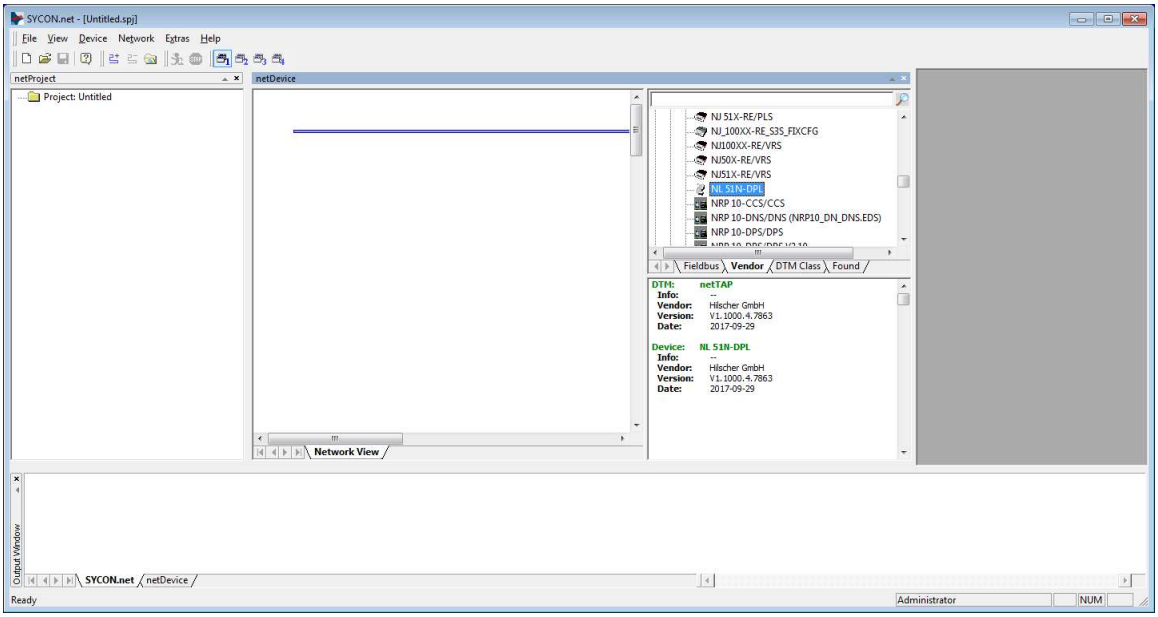


Figure 16: Select NetLINK from SYCON.net

5. Drag **NL 51N-DPL** to the **Network View** pane.

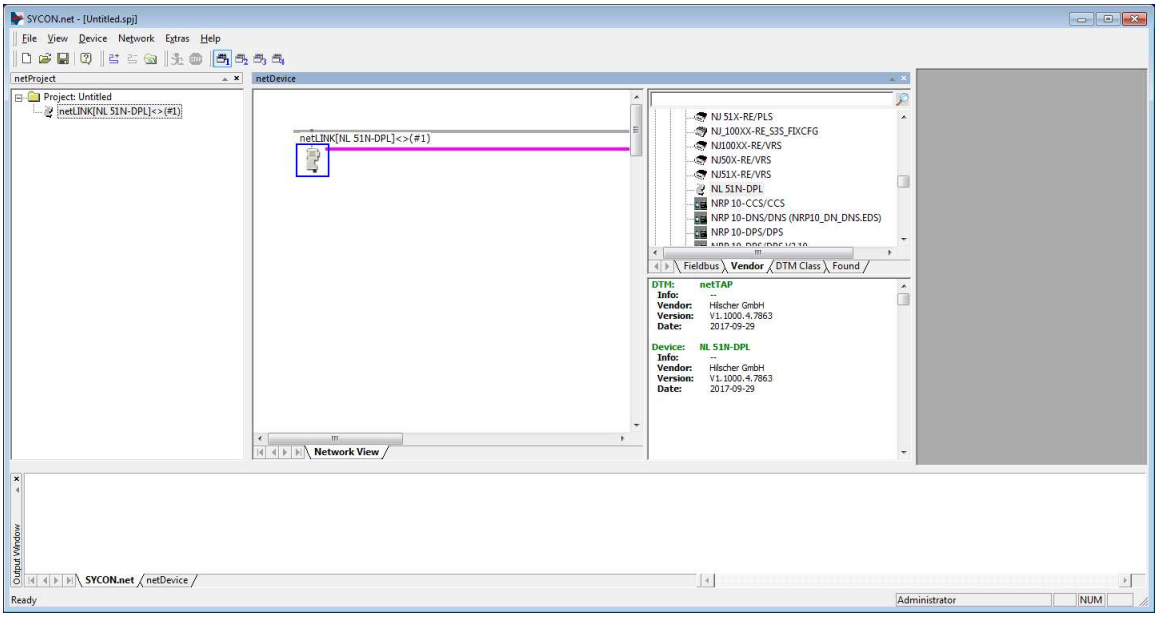


Figure 17: Drag NetLINK to Network View

6. Right-click the **netLINK** object.
7. Select **Configuration**.
8. Select **Proxy**.

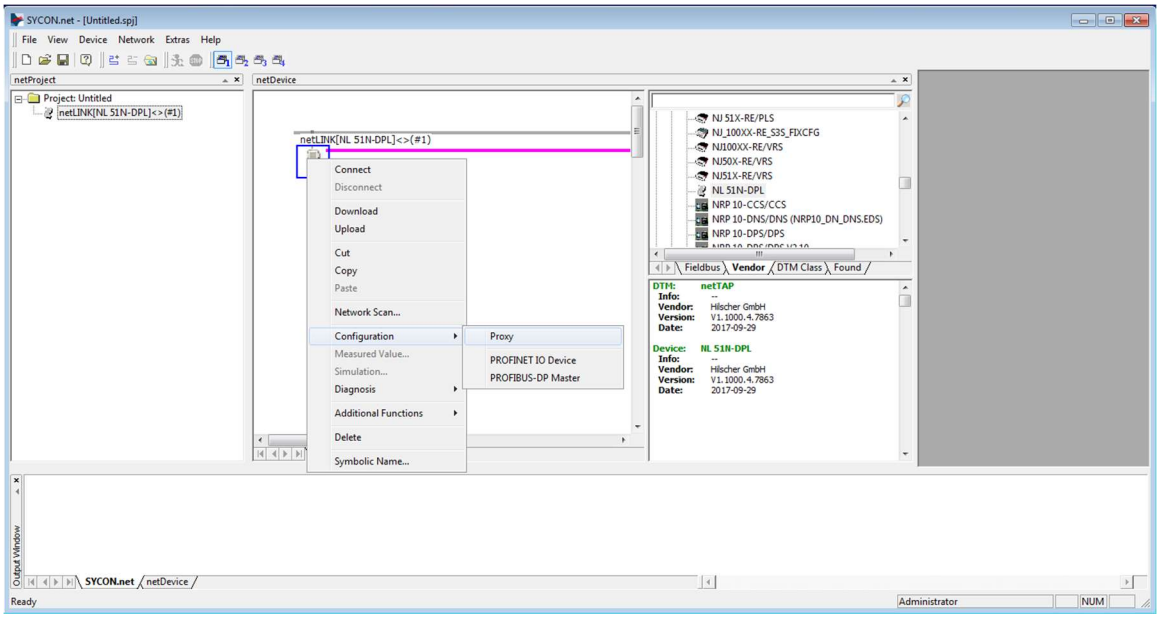


Figure 18: Select Configuration and then Proxy

Search for SYCON IP Address

1. From the netDevice Proxy netLINK window, navigate to **netXDriver** on the **Navigation area** pane.
2. Select **netXDriver**.
3. From the **netX Driver** pane, select the **TCP Connection** tab.
4. Verify that the settings match the settings in Figure 19.
5. If not, do the following. (For more information about the settings, see the Settings section of the netTAP, netBRICK and netLINK Configuration of Gateway and Proxy Devices Operating Instruction Manual.)
    a. Select **Use IP Range**.
    b. Set the **IP Address** range between **10.1.20.1** – **10.1.20.10**.
    c. Set the **TCP Port** to **50111**.
    d. Click **Save**.

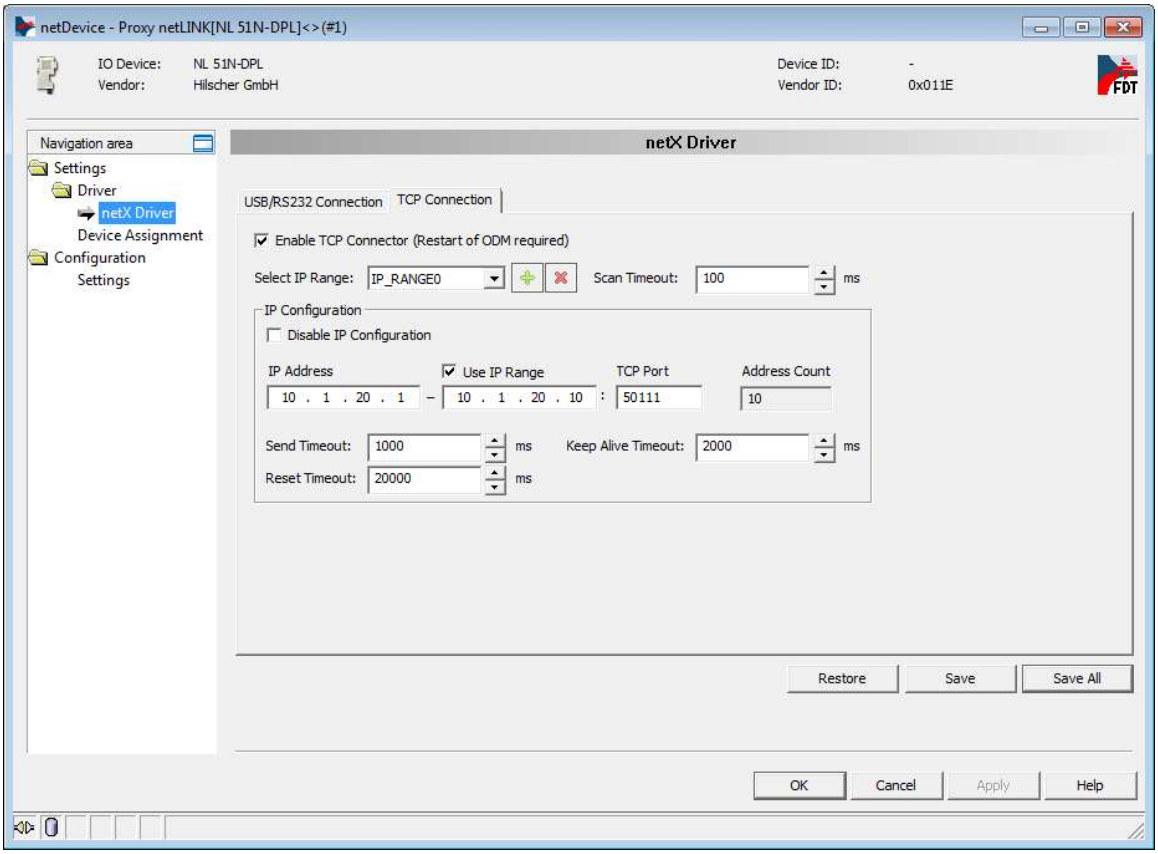


Figure 19: Search for SYCON IP Address

6. From the **Navigation area** pane, select **Device Assignment**.
7. From the **Device Assignment** pane, select **NL 51N-DPL**.
8. Click **OK**.

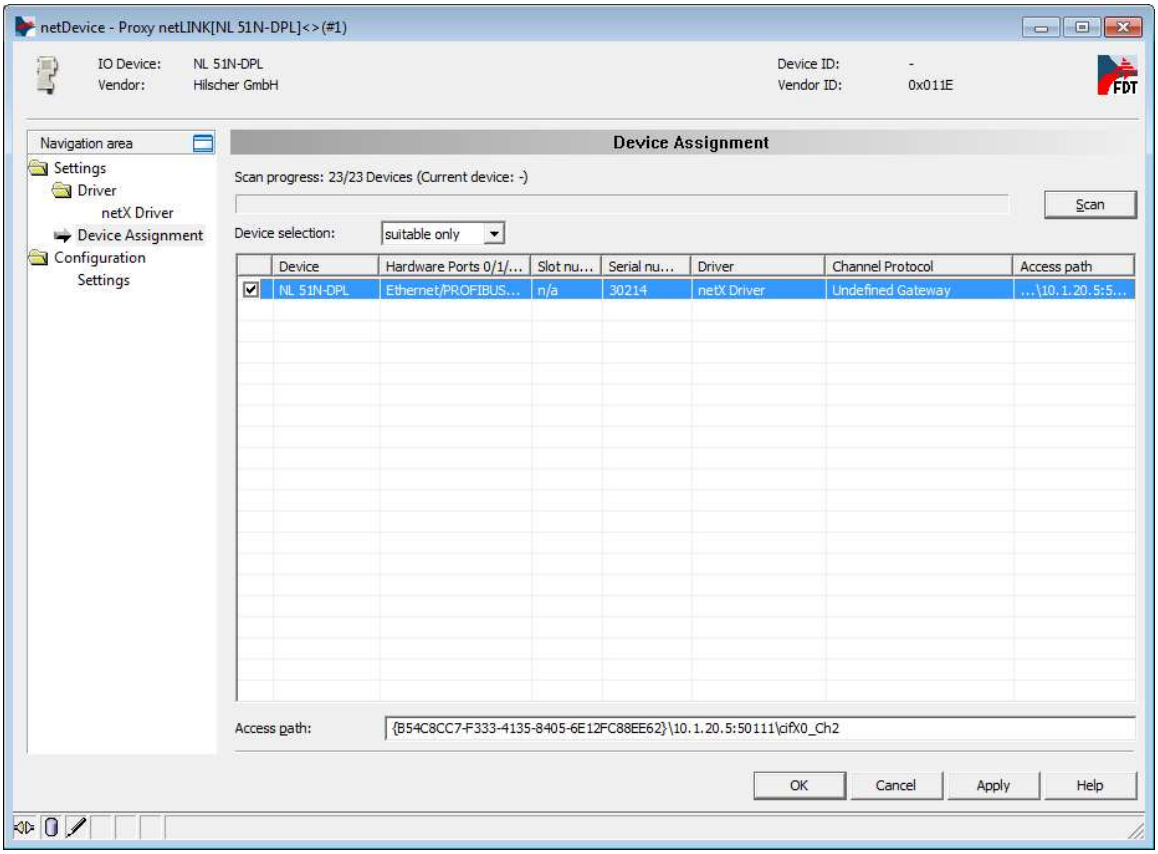


Figure 20: Select SYCON Device

Network Scan

1. Right-click the **netLINK** object.
2. Select **Network Scan**.

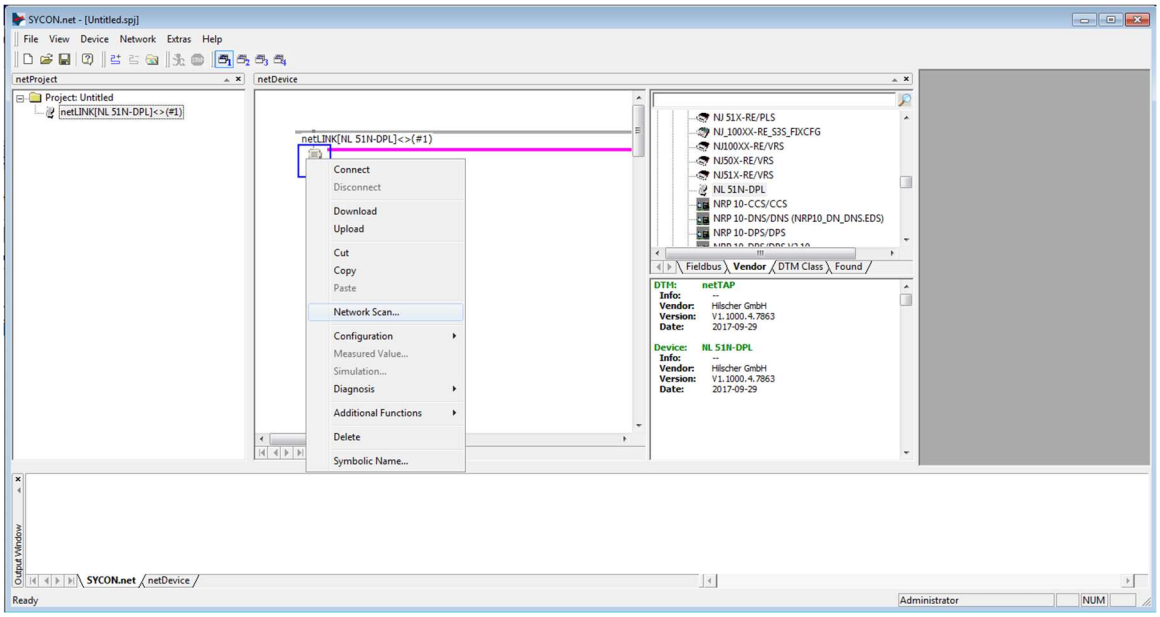


Figure 21: SYCON Network Scan Option

3. From the Scan Response of Device window, verify that SB5500, SB5575, or SB5580 appears in the **DTM Device** column.
4. Click **Create Devices**.

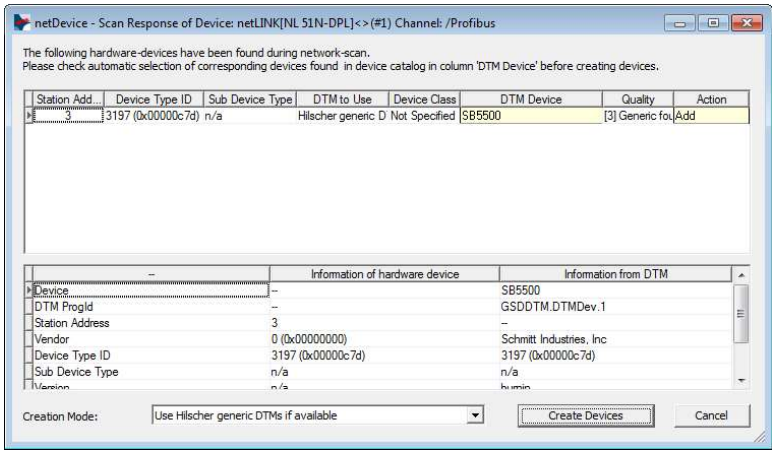


Figure 22: Scan Profibus

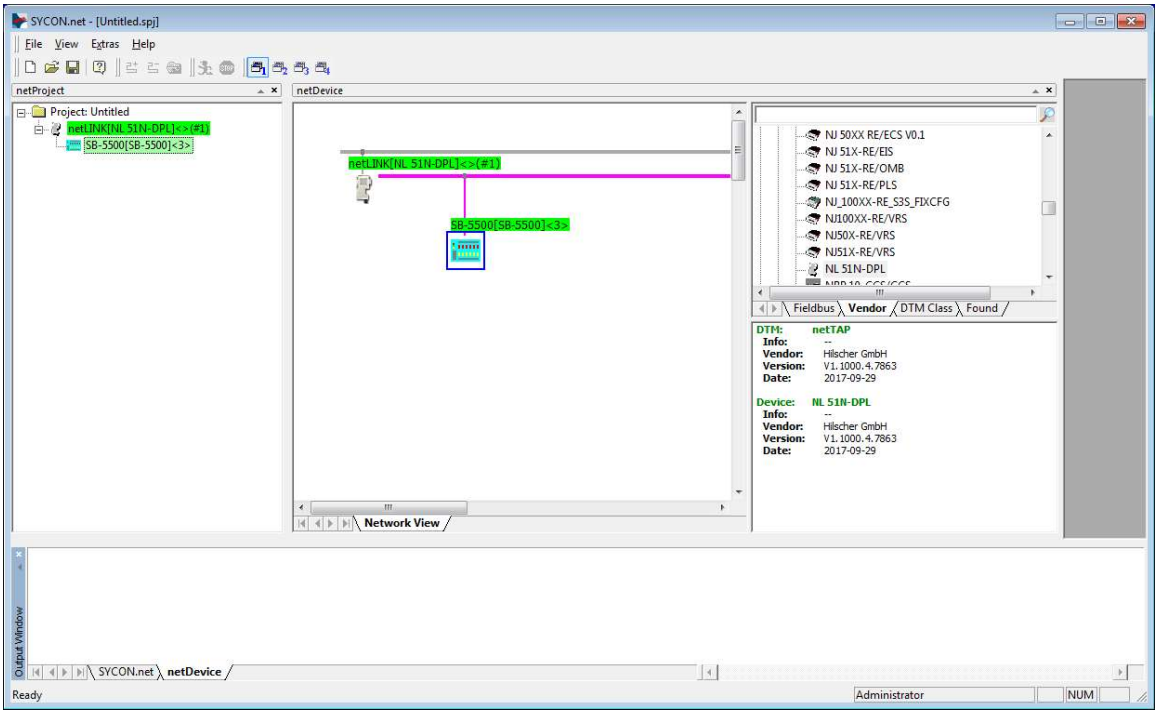


Figure 23: Profibus Added

SYCON Download

1. From the **netDevice** pane, right-click the **netLINK** object.
2. Select **Download**.

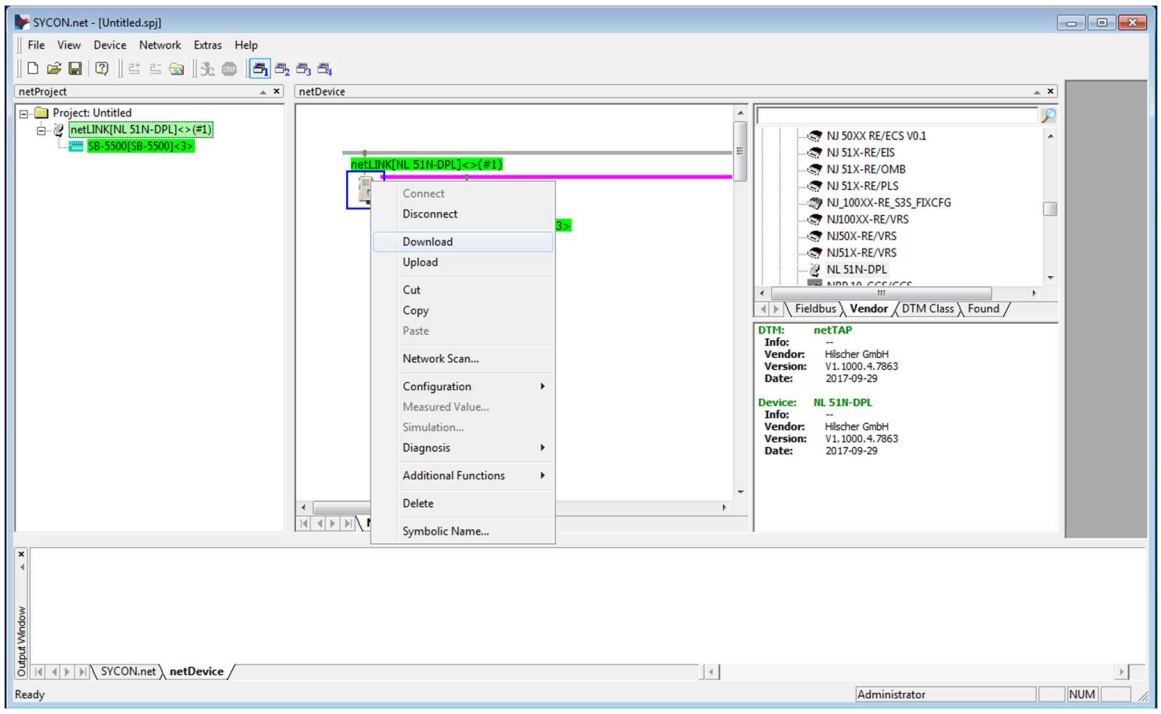


Figure 24: SYCON Download

3. When the following Download message appears, click **Yes**.

   “If you attempt to download during bus operation, communication between master and slaves is stopped. Do you really want to download?”

4. Wait until the **Reset Device. Please wait!** message disappears.

Export GSDML

1. From the **netDevice** pane, right-click the **netLINK** object.
2. Select **Additional Functions**.
3. Select **PROFINET IO Device**.
4. Select **Export GSDML**.

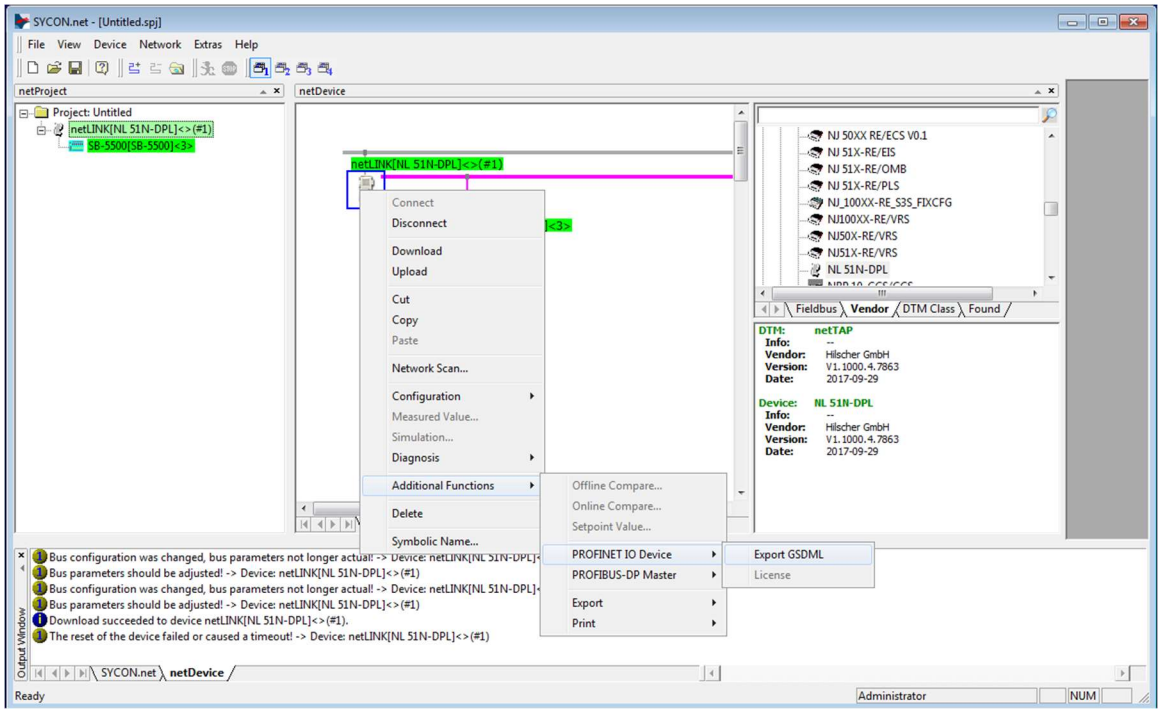


Figure 25: Export GSDML

5. From the Save As window, do the following:
    a. Navigate to a **Save in** location.
    b. Click **Save**.

Save Project and Disconnect

1. From the **File** menu, select **Save As**.
2. From the **Save As** window, type a name for the project in **File name**.
3. Click **Save**.

4. If the objects in the **netDevice** pane are highlighted after the system finishes saving the project, right-click **netLINK**.
5. Select **Disconnect**.
6. Close the SYCON program.

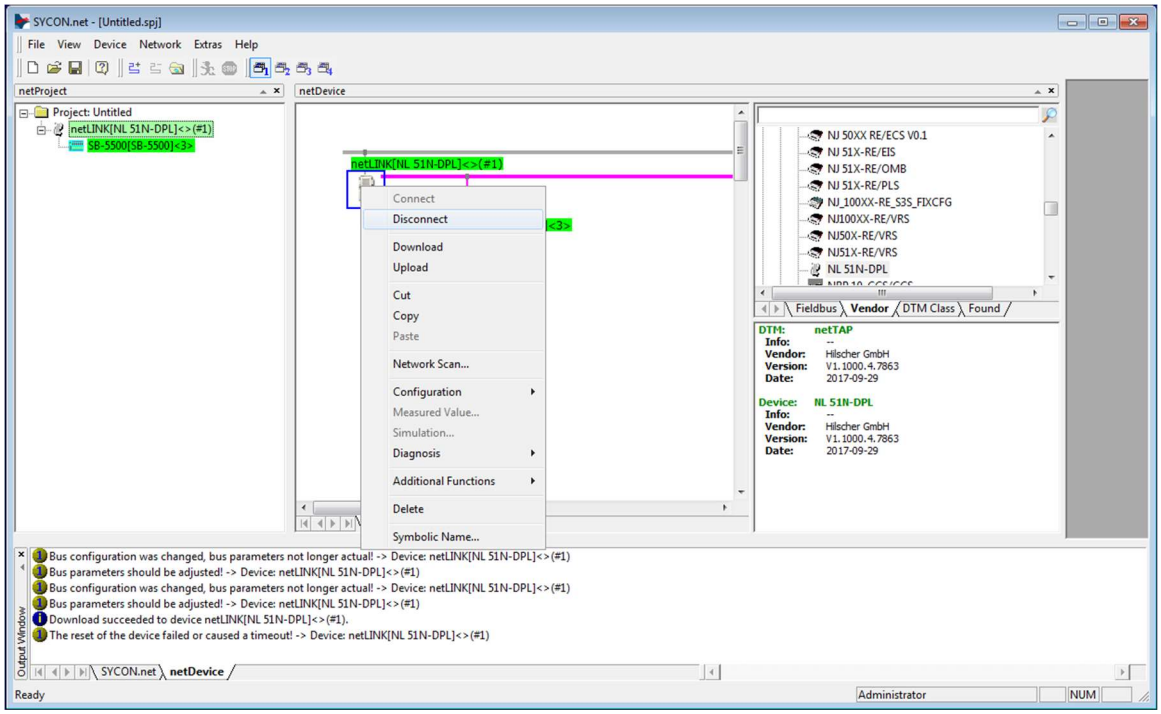


Figure 26: SYCON Disconnect

The GSDML file is generated, and the SBS controller is configured. The GSDML file has the same bytes as the “Parameters” tables. Use the file and the configuration to connect the Profinet interface of the machine tool to the SBS controller. If the slot card configuration changes, repeat this procedure.

Profinet has the capability in its GSDML file to identify the individual bytes and bits by name. Some machine controls may support the byte names and some support the bit names. With further processing, GSDML files with byte or bit definitions can be generated.

Ordering and System Maintenance

Ordering Profibus and Profinet

Selection of your Profibus or Profinet system requires only a few moments of your time:

1. Complete the application questionnaire provided by your SBS Balance Systems dealer.
2. Based upon response to the questionnaire, your dealer selects the appropriate mounting adapter and determines the mass compensation required by your application.
3. Your system is delivered and matched to your exact needs. The system comes with complete operating instructions, which makes operator training and system use simple and which helps to bring an immediate return on your investment.

Support

For support, contact the machine builder or SBS at:

Accretech SBS, Inc.
2451 NW 28th Avenue
Portland, Oregon 97210 USA

Tel.: +1 503.227.7908
Fax: +1 503.223.1258
TechSupport@accretechSBS.com
https://accretechsbs.com/

Return and Repair Policy

Accretech SBS, Inc. policy is to give highest priority to the service needs of our customers. We recognize the cost of machine downtime, and we strive to deliver same day repair of items arriving by overnight delivery at our facility. Because of the complication and delays involved with international shipments, customers outside the continental U.S. should contact their local SBS Balance System source for service support. Before returning any equipment for repair, you must contact Accretech SBS, Inc. for a Return Materials Authorization (RMA) number. Without this tracking number, Accretech SBS, Inc. cannot ensure prompt and accurate completion of your repair needs. Failure to obtain an RMA number may result in substantial delay.