

## 4x70A

## Implementation Guide

## PROFINET

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4x70A PROFINET communication module

Implementation using Siemens TIA Portal Function Block (FB)



Software: Use with 4x70.CONCTR\_4.190123.1v2 (or newer)  
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# Introduction

This document is a guide for implementation of an PROFINET interface for Eilersen capacitive load cells, with a Siemens TIA Portal Function Block (FB).

The software library also includes one HMI Screen, with six pop-up screens.

## IMPORTANT:



Please note that this PLC program block is only intended as an example for inspiration and is not as such a product on which Eilersen Electric A/S offers any warranty or support.

Furthermore, Eilersen Electric A/S is not responsible for any loss or damage caused as a result of using this program block.

Unauthorized copying and distribution of the program block is prohibited as it is the property of Eilersen Electric A/S.

# Import Library

When installing the Function Block and HMI Screen, you will have to drag and drop from the “Eilersen 4X70A” library. The installation of this library is described in this section.

Click on the “Libraries” tab, at the right side of Siemens Tia Portal, then right click at an empty space and click “Retrieve library...”. As seen on Figure 1.

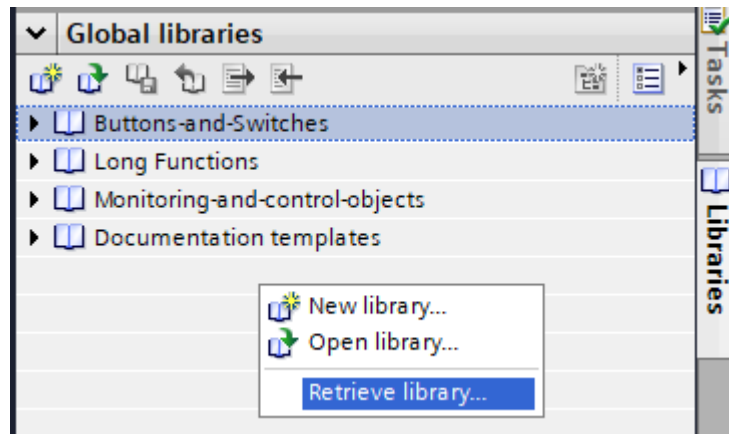


Figure 1 - Right-click on library

Browse and find the “Eilersen 4X70A” library file, and click “Open”.

Now the library is installed and ready to use.

## Install GSD file

In this section you will be guided through on how to install the GSD file. The latest GSD file, for this Profinet module, can be found on the Eilersen website.

Go to Options -> Manage general station description files (GSD).

At the “Installed GSDs” tab, check the “Source path” is set to the current location of the GSD file from Eilersen.

Check the box of the GSD file from Eilersen, and Click on the “Install” button. As seen on Figure 2.

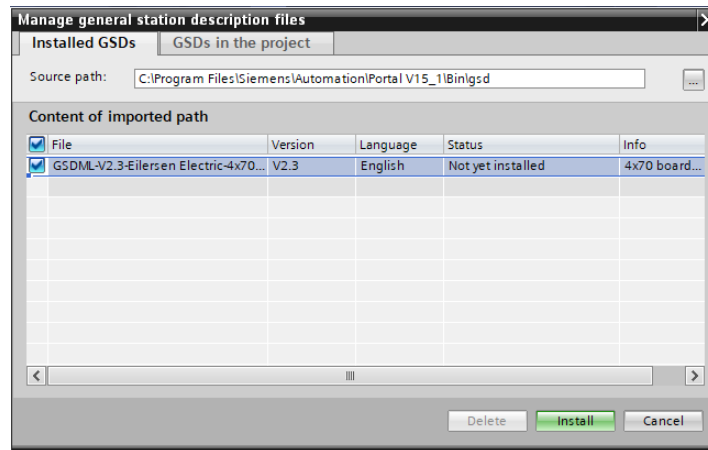


Figure 2 - GSD installation window

Now you have installed the GSD file into Siemens Tia Portal.

## Use of the GSD device

Go to “Devices & networks”, and click on the “Hardware catalog” on the right-hand side. In the catalog go to “Other field devices” -> “PROFINET IO” -> “I/O” -> “Eilersen Electric” -> “4x70 CONCTR\_4”, now drag and drop the “4x70 V1.0” device to your network.

## Installation of Function Block (FB)

For the installation of the Function Block, the library has to be installed beforehand. See the [“Import Library”](#) section.

Go to the “Eilersen 4X70A” global library and right-click on the library, then choose “Update types” and click on “Project...”, as seen on Figure 3.

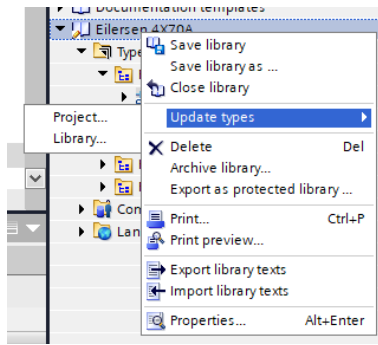


Figure 3 - Global libraries

Now the function block (FB) is imported to your "Project Library". Next you will have to drag and drop the FB from "Types" in your "Project Library", into your project.

Remember also to drag and drop the PLC tags from the "Master copies" from the global library to your project.

Now the Function Block is installed and ready to use.

## Description of the Function Block

This section describes the required tags on the Function Block (FB) as seen on Figure 4.

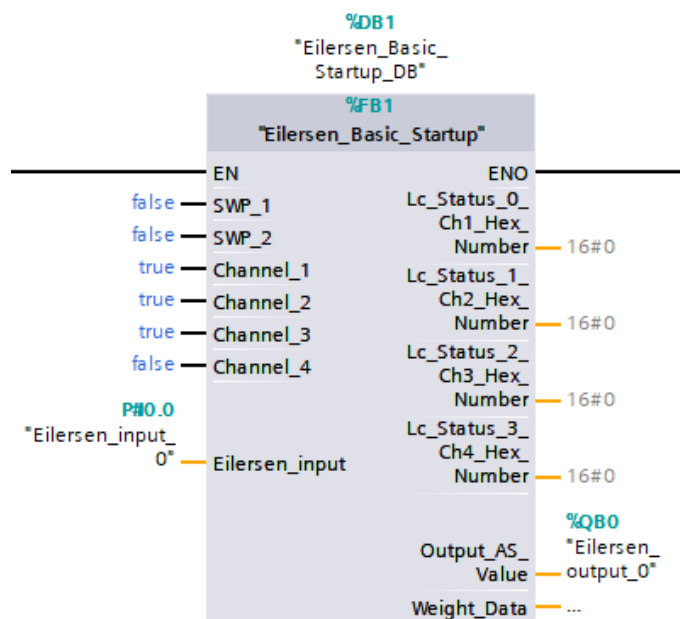


Figure 4 - Function Block

At the next page, there is a description of all input and outputs of this Function Block (FB).

Operand	Data type	Type	Description
SWP_1	BOOL	Input	This is the physical SWP.1 switch setting, must be set true (1) or false (0), as on the 4X70A Profinet module.
SWP_2	BOOL	Input	This is the physical SWP.2 switch setting, must be set true (1) or false (0), as on the 4X70A Profinet module.
Channel_1	BOOL	Input	This must be set true (1) if a loadcell is connected to channel 1, if not then this must be set false (0).
Channel_2	BOOL	Input	This must be set true (1) if a loadcell is connected to channel 2, if not then this must be set false (0).
Channel_3	BOOL	Input	This must be set true (1) if a loadcell is connected to channel 3, if not then this must be set false (0).
Channel_4	BOOL	Input	This must be set true (1) if a loadcell is connected to channel 4, if not then this must be set false (0).
Eilersen_input	UDT – “Eilersen_input”	Input	Input address area from the Profinet module.
Lc_Status_0_Ch1_Hex_Number	WORD	Output	Channel 1 raw value from Profinet module.
Lc_Status_1_Ch2_Hex_Number	WORD	Output	Channel 2 raw value from Profinet module.
Lc_Status_2_Ch3_Hex_Number	WORD	Output	Channel 3 raw value from Profinet module.
Lc_Status_3_Ch4_Hex_Number	WORD	Output	Channel 4 raw value from Profinet module.
Output_AS_Value	Sint	Output	Output data to the 4x70 PROFINET module.
Weight_Data	Struct	Output	Structure that contains 3 Real's, “Net_Weight”, “Gross_Weight” and “Cal_Factor”.

## Installation of HMI Screen

This section clarifies how to install the HMI Screen and pop-ups. The HMI Screen has been developed using a TP1200 Comfort panel as a template. If you use a smaller panel, you will have to resize the screen to fit yours.

To install the HMI project, you will have to drag and drop the “Eilersen\_Template”, from the global library, into your HMI project.

Remember also to drag and drop the HMI tag list into your HMI project.

### Pop-ups

To install all six pop-up screens, you have to look in the global library under HMI -> Pop-up screens and drag and drop all six pop-ups to your HMI project under Screen management -> Pop-up screens.

# HMI Functionality

In this section there are shown pictures from the HMI screen and all of the pop-up screens.

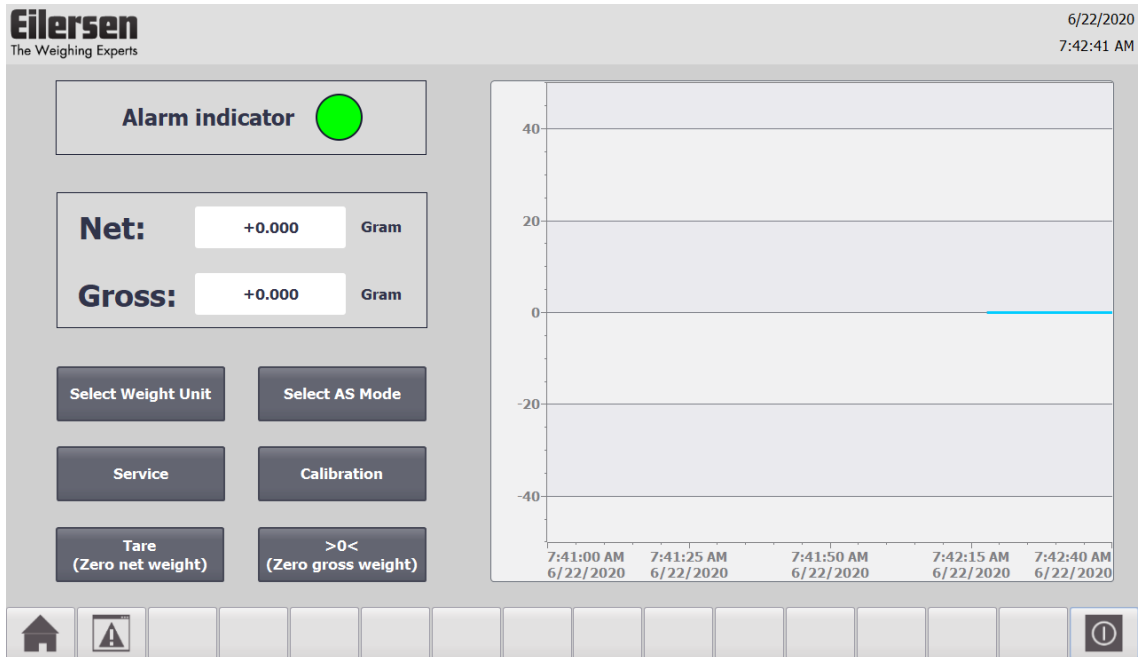


Figure 5 - HMI Front screen

On the HMI screen, there are shown two parameter values: “Net” and “Gross” weight. See Figure 5.

Each of the parameters has a button for zeroing the weight:

- “Tare (Zero net weight)”
- and
- “>0< (Zero gross weight)”

When either of these buttons are pressed, a warning associated to that button are shown, as seen on Figure 6 and Figure 7.



Figure 7 - Tare warning display



Figure 6 - >0< warning display

The alarm indicator seen on Figure 5, goes from green to red only if a major alarm occurs.

There is also a live graph of both the Net and Gross weight, as seen on Figure 5.

When the “Select AS Mode” button is pressed a popup appears, see Figure 8.

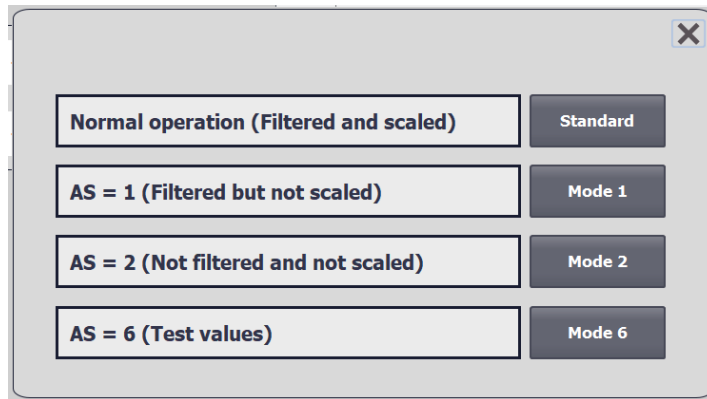


Figure 8 - AS mode popup

Here it is possible to select between four modes, which are:

- Standard: Filtered and scaled (Default mode)
- Mode 1: Filtered but not scaled (The signal is not scaled but it is “adjusted by the calibration factor” E.g. if there are 3 legs on a tank and only 1 load cell, the signal weight shown will be tripled)
- Mode 2: Not filtered and not scaled (The signal is not scaled but it is “adjusted by the calibration factor”)
- Mode 6 (Test mode): shows hardcoded signal values

These “AS” modes are described in more details in Eilersen user manual for the 4x70 module.

When the “Calibration” button is pressed, a popup appears, see Figure 9.

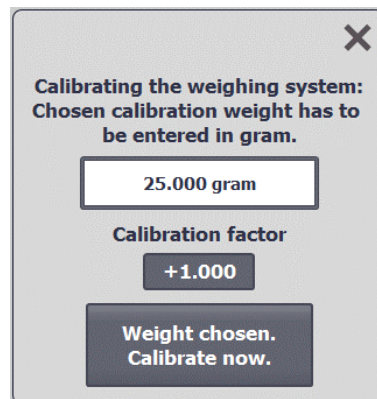


Figure 9 - Calibration popup-window



From here it is possible to calibrate the weighing system.

Enter the known weight into the input display (in gram) and then pressing the “Weight chosen. Calibrate now” button.

You can also adjust the calibrating factor by pressing the input display.

Beware that if you press the “Weight chosen. Calibrate now” button, after you manually adjusted the calibrating factor, then this manual change will not take effect.

After the system is calibrated you can see the calibrating factor by pressing the “Service” button.

Make sure that the calibration factor is not too far from what is described in Eilersen user manual section “System calibration of weighing system”.

When the “Service” button is pressed, a popup appears, see Figure 10.

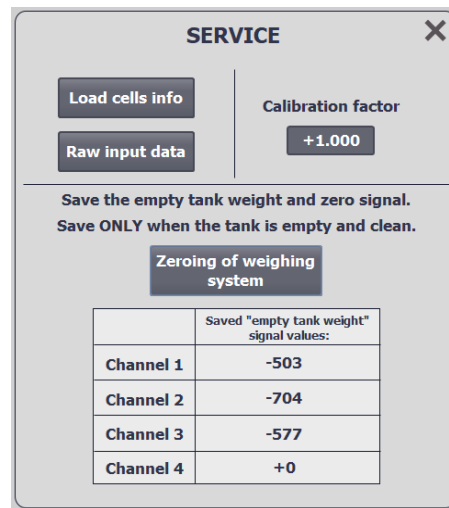


Figure 10 - Service popup

This is a service window, from here it is possible to:

- See the Raw input data from the PROFINET-module, by pressing the “Raw input data” button. When pressed a new popup appears, see Figure 11.
- See each load cell’s serial number, exponent and capacity, by pressing the “Load cells info” button. When pressed a new popup appears, see Figure 12.
- See calibration factor
- Save the empty tank weight by pressing the “Zeroing of weighing system” button. (This is a raw calibration)
- Change the empty tank signal values manually

RAW INPUT DATA		
Register	1100000000000111	
	Status	Signal
Channel 1	0000	-503
Channel 2	0000	-704
Channel 3	0000	-577
Channel 4	0080	0
<small>Input from PROFINET:            C007 0000 FFFFE09 0000 FFFFD40 0000 FFFFDBF 0080 00000000            Output to PROFINET:            00000000</small>		

Figure 11 - Raw input data from PROFINET-module

Refresh

### Load cells info

← X

Channel 1: Lc serial number:

Channel 2: Lc serial number:

Channel 3: Lc serial number:

Channel 4: Lc serial number:

Channel 1: Lc capacity:

Channel 2: Lc capacity:

Channel 3: Lc capacity:

Channel 4: Lc capacity:

Channel 1: Lc exponent:

Channel 2: Lc exponent:

Channel 3: Lc exponent:

Channel 4: Lc exponent:

Figure 12 - Load cells info popup

When the button “Select Weight Unit” is pressed, a popup appears, see Figure 13. From the popup it is possible to choose between the weight units: Gram, Kg, Ton. It is not possible to choose a weight unit if an error is active.

### Select weight unit

X

Gram

Kg

Ton

Figure 13 - Select weight unit pop-up

## First time usage

- Make sure that the tank on the load cells is empty and clean.
- Press “Service” and then press the “Zeroing of weighing system” button.
- Put the calibration weight in / on the tank.
- Press the “Calibration” button. Enter the calibration weight into the input display in gram.
- Press the “Weight chosen. Calibrate now” button.
- Make sure that the weight now showing on the “Frontscreen”, is the same as the calibration weight.

## Revision History

Date	Author	Rev.	Update
2020-08-21	HJA	1v2	<i>Initial document created. (based on Guide_Siemens_Eilersen_V1.2)</i>
2020-11-26	HJA	1v2a	<i>Added disclaimer in the introduction.</i>

## Contact

With further questions or improvement suggestions please contact us:

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