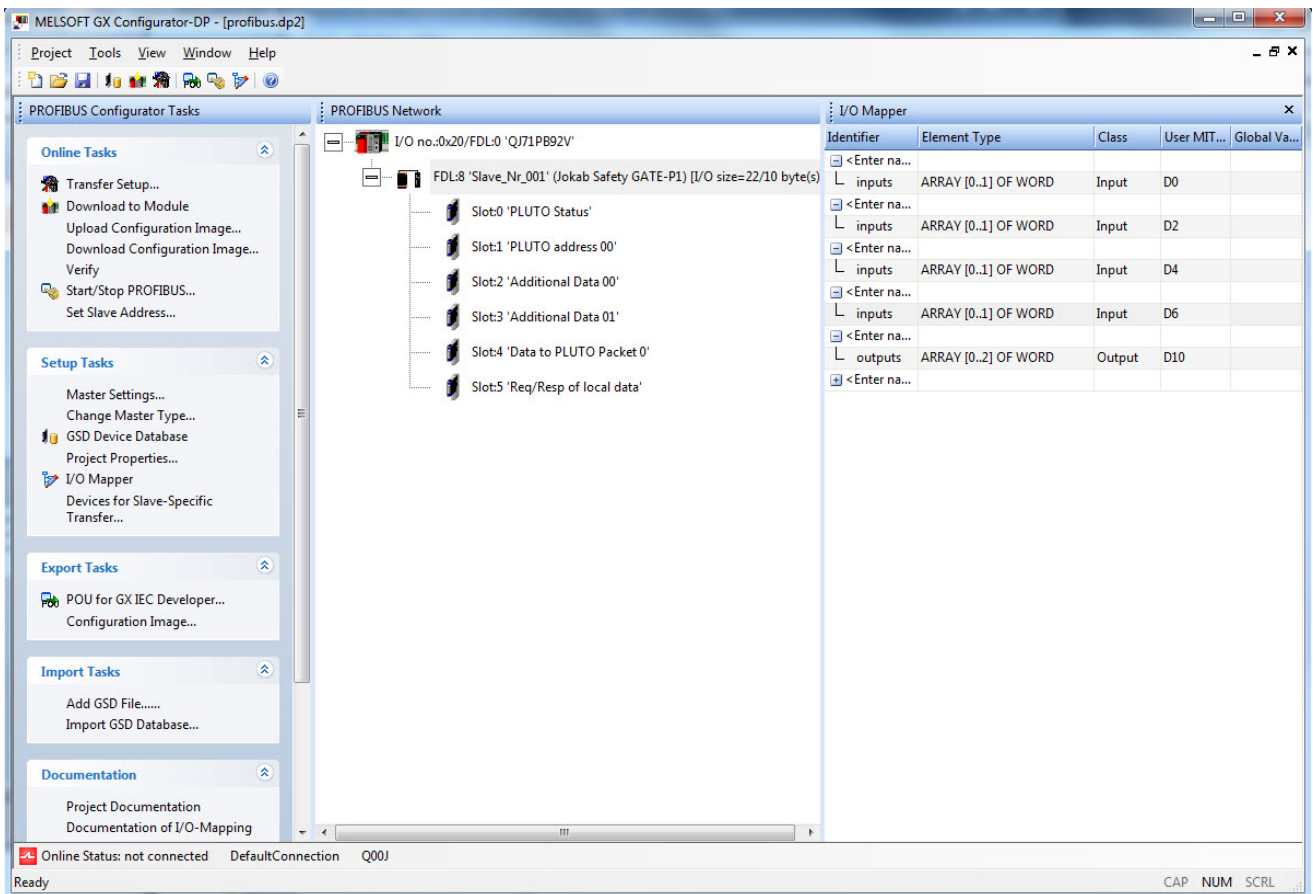


# Pluto Gateway Mitsubishi Q Integration Manual



## Table of contents:

1	General .....	4
2	Hardware .....	5
2.1	Casing.....	5
2.2	Pluto bus .....	7
2.2.1	Connecting the Pluto bus.....	7
2.2.2	Baud rate detection.....	7
2.2.3	Status LED for Pluto bus.....	7
2.2.4	Gateway Address Pluto bus settings .....	8
2.3	Profibus.....	9
2.3.1	Connecting the Profibus.....	9
2.3.2	Baud rate Profibus .....	10
2.3.3	Status LED for Profibus.....	10
2.3.4	Gateway Address Profibus setting.....	11
3	Setup in Pluto Manager.....	12
3.1	Selecting the function library.....	12
3.2	Transmitting from Pluto to Mitsubishi PLC .....	13
3.2.1	Transmit global data from Pluto .....	13
3.2.2	Transmit other data from Pluto.....	14
3.2.2.1	ToGateway_User_A:.....	15
3.2.2.2	ToGateway_User_B:.....	15
3.2.2.3	ToGateway_User_C:.....	16
3.2.2.4	ToGateway_ErrorCode:.....	16
3.2.2.5	ToGateway_B46_I20_I47: .....	17
3.3	Transmitting from the Mitsubishi PLC to Pluto.....	18
3.3.1	Setup External Communication in Pluto Manager .....	18
3.3.2	Receive Data in Pluto.....	19
3.3.2.1	Ext_Sig:.....	19
3.3.2.2	Ext_Val:.....	19
3.3.2.3	ExtVarBlock:.....	20
4	Setup in GX Configurator DP .....	21
4.1	Setup the HW Config .....	21
4.1.1	GSD-file selection and installation .....	21
4.1.2	Gateway selection and connection .....	22
4.1.2.1	Configuration options .....	23
4.1.2.2	Req/Resp of local data.....	25
4.1.2.3	Additional Data 0-31 .....	25
4.2	Jokab function block library.....	26
4.2.1	Installation.....	26
4.2.2	Use.....	26
4.2.3	Description of function blocks .....	27
4.2.3.1	Function block - Global data from Pluto (read) .....	27
4.2.3.2	Function block - Global data from Pluto ASi (read).....	28
4.2.3.3	Function block - Global data from Pluto B42 ASi (read) .....	29
4.2.3.4	Function block - Data to Pluto (write).....	30
4.2.3.5	Function block – Additional data – USER A (read) .....	31
4.2.3.6	Function block – Additional data – USER B (read) .....	32
4.2.3.7	Function block – Additional data – USER C (read).....	33
4.2.3.8	Function block – Additional data – Error code (read).....	34
4.2.3.9	Function block – Additional data – B46 I20-I47 (read).....	35
4.2.3.10	Function block – Additional data – ASi 16-31 safe (read).....	36
4.2.3.11	Function block – Additional data – ASi 1-3 non safe (read).....	37
4.2.3.12	Function block – Additional data – ASi 4-7 non safe (read).....	38
4.2.3.13	Function block – Additional data – ASi 8-11 non safe (read).....	39

4.2.3.14 Function block – Additional data – ASi 12-15 non safe (read).....	40
4.2.3.15 Function block – Additional data – ASi 16-19 non safe (read).....	41
4.2.3.16 Function block – Additional data – ASi 20-23 non safe (read).....	42
4.2.3.17 Function block – Additional data – ASi 24-27 non safe (read).....	43
4.2.3.18 Function block – Additional data – ASi 28-31 non safe (read).....	44

# 1 General

The Profibus Gateway is a unit used to transfer data between Profibus and Pluto bus. Communication both ways is possible.

This document describes how to setup and work with the Pluto gateway Gate-P2 in Pluto Manager and Mitsubishi GX Configurator-DP/GX IEC Developer. It also brings up how to use a number of sample function blocks for the Mitsubishi Q CPU family for complete communication back and forth between a Pluto unit and a Mitsubishi PLC, through the gateway. All functions are samples and are to be used "as is".

## 2 Hardware

### 2.1 Casing

Below are pictures describing the Pluto GATE-P2.

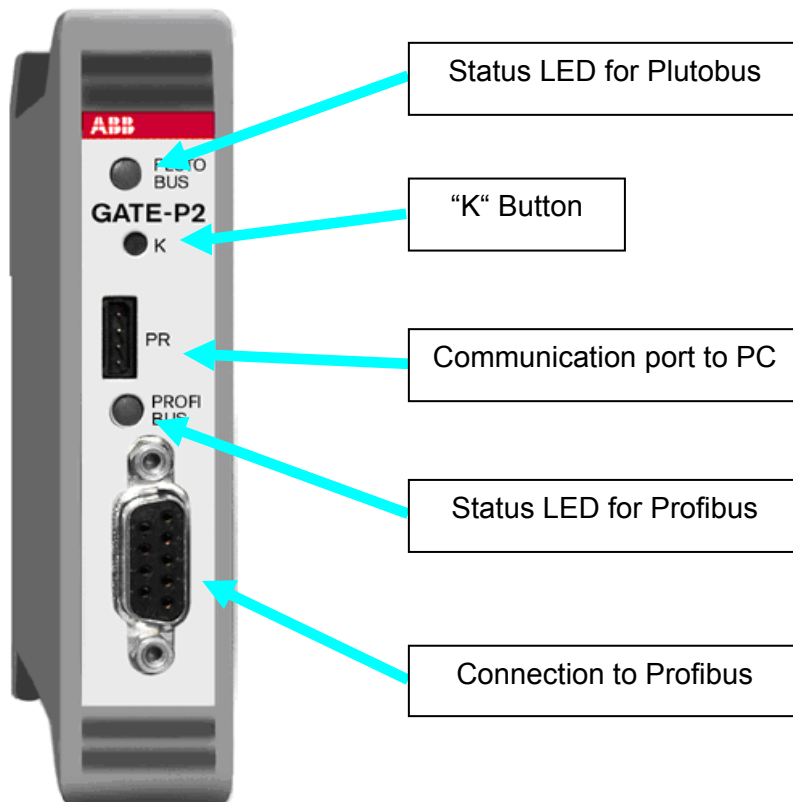


Figure 1

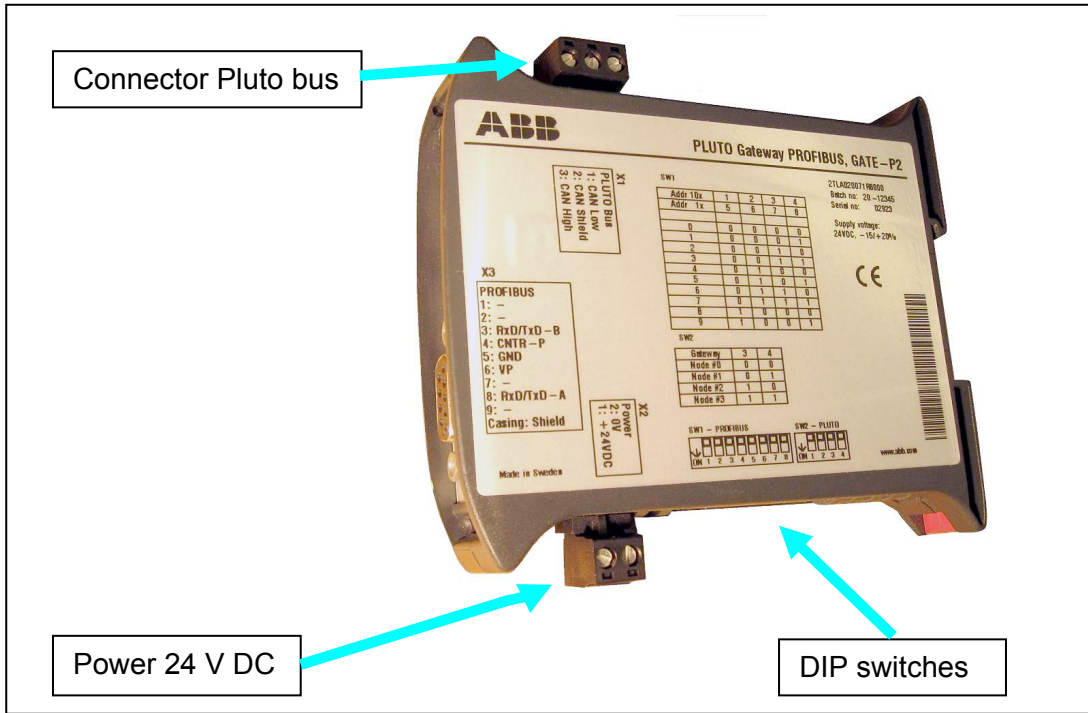


Figure 2

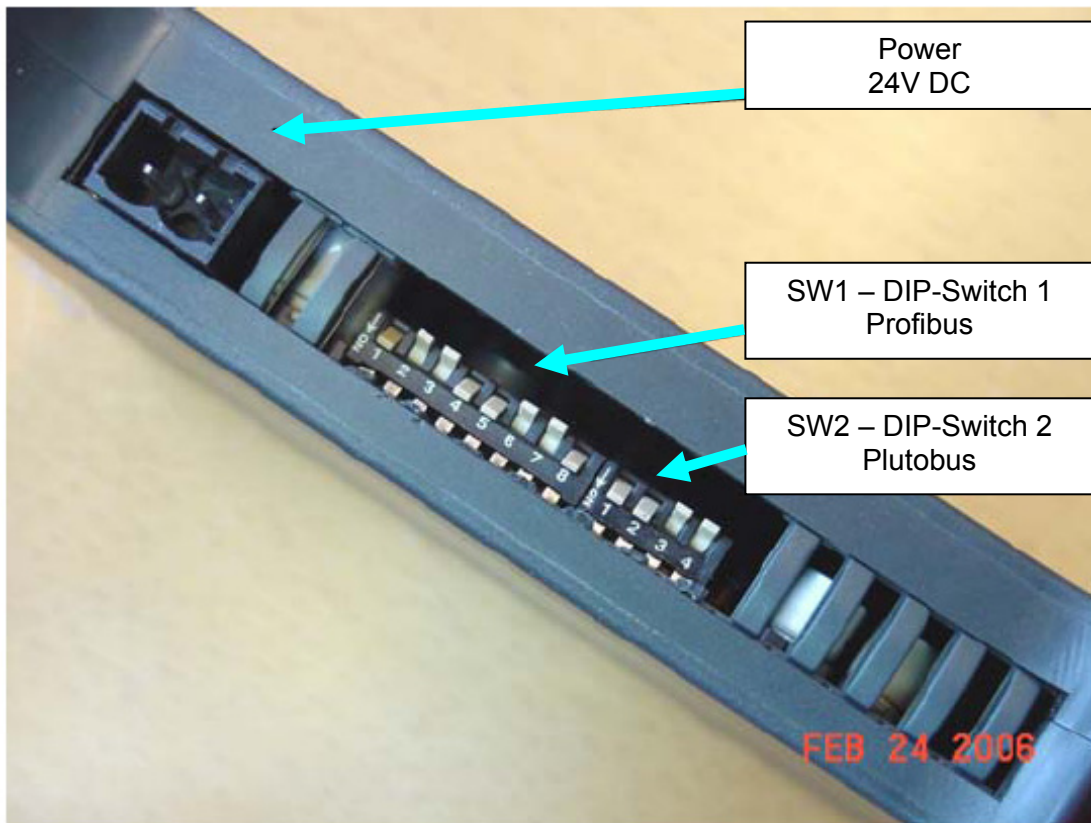


Figure 3

## 2.2 Pluto bus

The Pluto bus is a CAN bus which means the connection shall follow the common rules for all CAN buses.

### 2.2.1 Connecting the Pluto bus

The connector for the Pluto bus is located on the upper side.

If the gateway is placed first or at the end of the bus a 120Ω end terminating resistor must be mounted.

PIN	Label	Description
1	CL	Pluto CAN-L
2	SE	Pluto CAN bus shield
3	CH	Pluto CAN-H

### 2.2.2 Baud rate detection

The gateway will automatically detect the baud rate on the Pluto bus when there is traffic on it.

### 2.2.3 Status LED for Pluto bus

LED – Pluto bus	Description	Remark
Flashing GREEN/RED	Pluto bus baud rate search.	When bus is not connected or no traffic on the bus.
GREEN short off flash	Pluto unit detected and baud rate is set.  In bridge function mode: Full operation.	
Flashing GREEN 40 /60 (on/off)	Gateway in full operation. Pluto bus is running and receiving SYNC/POLL/OUTPUT on the field bus. (Not for bridge function mode)	
Continuously RED	Fatal error detected.	

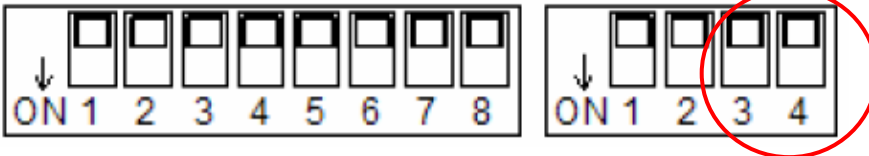
## 2.2.4 Gateway Address Pluto bus settings

The gateway has an address switch for giving it an address on the Pluto bus, switch "SW2". The address makes it possible to receive data on the Pluto bus in the Pluto unit from up to four different gateways.

***It is not necessary to set an address if the gateway is only used to send data to the Profibus. It is however encouraged to set an address if you use several gateways. This is because there will be trouble for the "Bus Status"- function in the Pluto Manager tool if there are gateways using the same address.***

Switch row 1 SW 1 - Profibus

Switch row 2 SW 2 – Pluto bus



Pluto bus address	DIP – SW2.3	DIP – SW2.4
1	0	0
2	0	1
3	1	0
4	1	1



## 2.3 Profibus

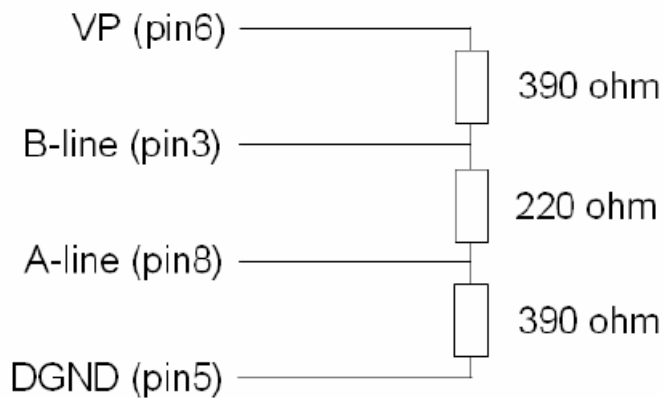
The Profibus is implemented in the Gateway as a DP Slave using the DP-V0 protocol. The DP-V0 protocol is fully compatible with the DPV1 and DPV2 protocols.

### 2.3.1 Connecting the Profibus

The gateway uses the standard Profibus connector (D-sub 9-poles).

Pin	Signal	Description
1	Shield	Shield/functional ground
2	-	-
3	RxD/TxD-P	Receive/Transmit data – plus (B wire – red)
4	CNTR-P	Repeater control signal (direction control), RTS signal
5	DGND	Data ground (reference potential for VP)
6	VP	Supply voltage – plus (P5V)
7	-	-
8	RxD/TxD-N	Receive/Transmit data – minus (A wire – green)
9	-	-

The PROFIBUS cable must have a termination in **each end of the bus**.



### 2.3.2 Baud rate Profibus

The PROFIBUS speed is automatically detected. Supported speeds are:

9.6 kbits/s, 19.2 kbits/s, 93.75 kbits/s, 187.5 kbits/s, 500 kbits/s, 1.5 Mbit/s, 3 Mbit/s, 6 Mbit/s and 12 Mbit/s

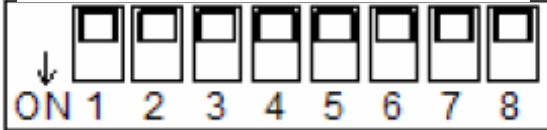
### 2.3.3 Status LED for Profibus

LED	Description	Remark
Fast flashing red/green	Baud Search	Trying to find and set the correct baud rate
Fast flashing green	Waiting Parameter	Discovered a working/live Profibus, waiting for the Master to contact the slave (Gateway)
Slow flashing green	Waiting Configuration	The Master has discovered the slave (Gateway) and the Gateway is now receiving the setup configuration
Fixed green	Data exchange state	Profibus up and running
Fixed red	Error detected	Bad address setting. Internal error.

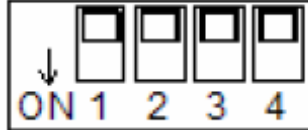
### 2.3.4 Gateway Address Profibus setting

The PROFIBUS address is set by DIP-switch “SW1” in the range 00 – 99 with BCD code setting. The singles are set on SW1:5-8 and the tens on SW1:1-4 according to the table below. If any of the address switches is using the “not used” setting then the PROFIBUS LED will light steady red.

Switch row 1 SW 1 - Profibus



Switch row 2 SW 2 – Pluto bus



Address 10 x	DIP – SW1.1	DIP – SW1.2	DIP – SW1.3	DIP – SW1.4
Address 1 x	DIP – SW1.5	DIP – SW1.6	DIP – SW1.7	DIP – SW1.8
1	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
Not used	1	0	1	0
Not used	1	0	1	1
Not used	1	1	0	0
Not used	1	1	0	1
Not used	1	1	1	0
Not used	1	1	1	1

Example: Address 25

SW 1.5 - SW1.8 = 0101

SW 1.1 - SW1.4 = 0010

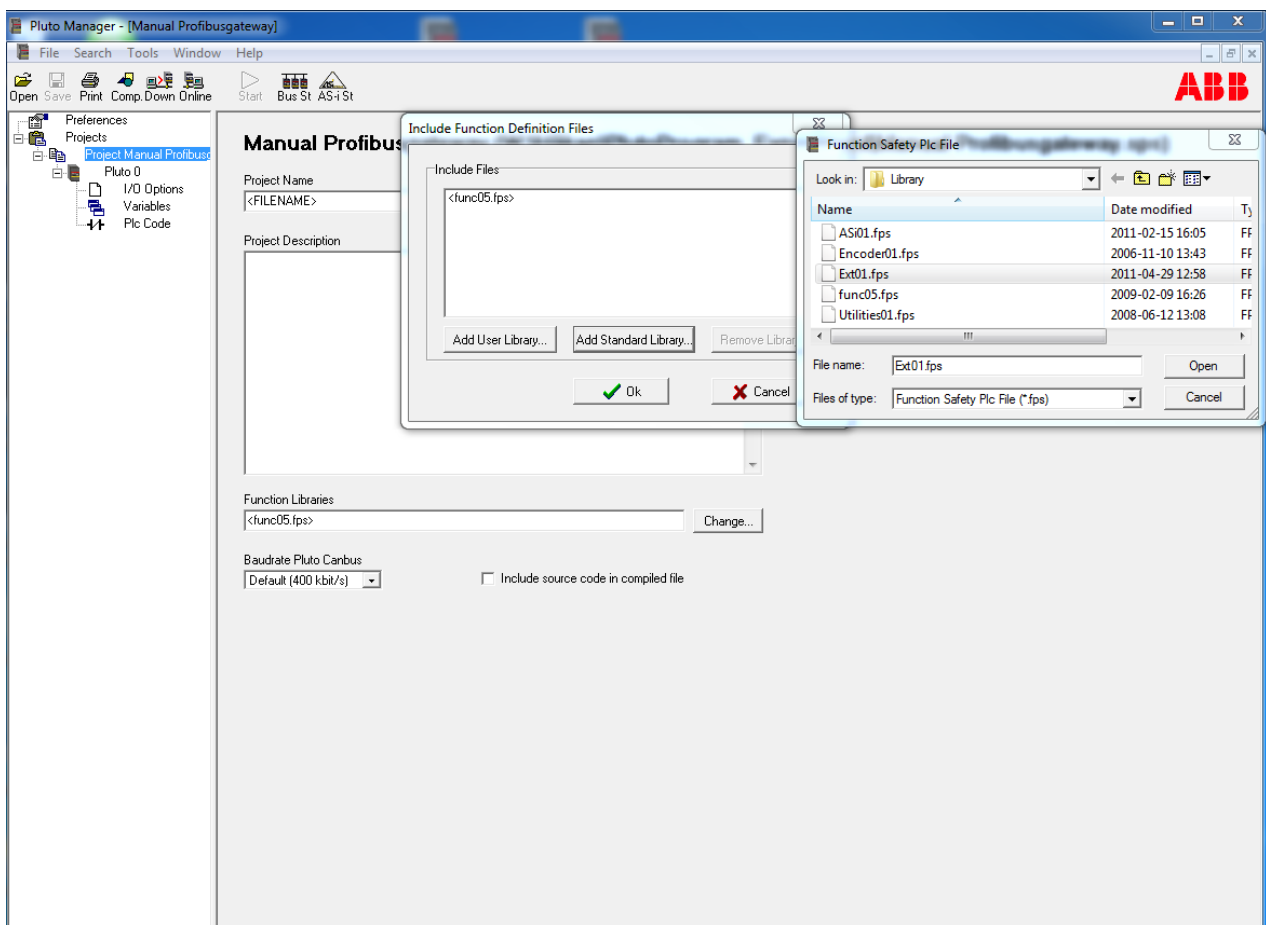
### 3 Setup in Pluto Manager

All global data from the Pluto units (max. 32) connected to the Pluto bus is sent constantly, cyclically. In order to receive the global data in the Mitsubishi PLC, no function library must be setup in Pluto Manager.

In order to send data other than the global data, and to receive data from the Mitsubishi PLC, a function library must be setup.

#### 3.1 Selecting the function library

1. Click on the user project
2. Click on the "Change" button
3. Click on "Add Standard Library"
4. Click and select "Ext01.fps", then click on Open



After this procedure the "Function Libraries" window should show (func05.fps is added by default):



## 3.2 Transmitting from Pluto to Mitsubishi PLC

This chapter describes how to transmit data on the Pluto bus, through the gateway and onwards to the super ordinate system.

*Be careful to not cause unnecessary bus load on the Pluto bus. A Pluto unit can only send four telegrams every PLC cycle. In a big network of Pluto units where every unit transmits every cycle the load on the bus will quickly become high. For examples on how to program see the “Pluto Gateway Manual”.*

### 3.2.1 Transmit global data from Pluto

The global data of each Pluto unit is constantly available on the Pluto CAN bus, with or without a connected gateway. The Pluto unit therefore does not need to be setup with any special transmission components for sending the global data.

The global data consists of the following components:

<b>Global inputs:</b>	Ix.0 to Ix.7 Ix.10 to Ix.17
<b>Global Memories:</b>	GMx.0 to GMx.11
<b>Global outputs:</b>	Qx.0 to Qx.3

Where “x” is the number of the Pluto unit.

Further setup in Pluto Manager for global data is not necessary!

**Note:** In Pluto B46-6 not all of the safety inputs are available as global data. The outputs Qx.4 and Qx.5 are not sent in the global data.

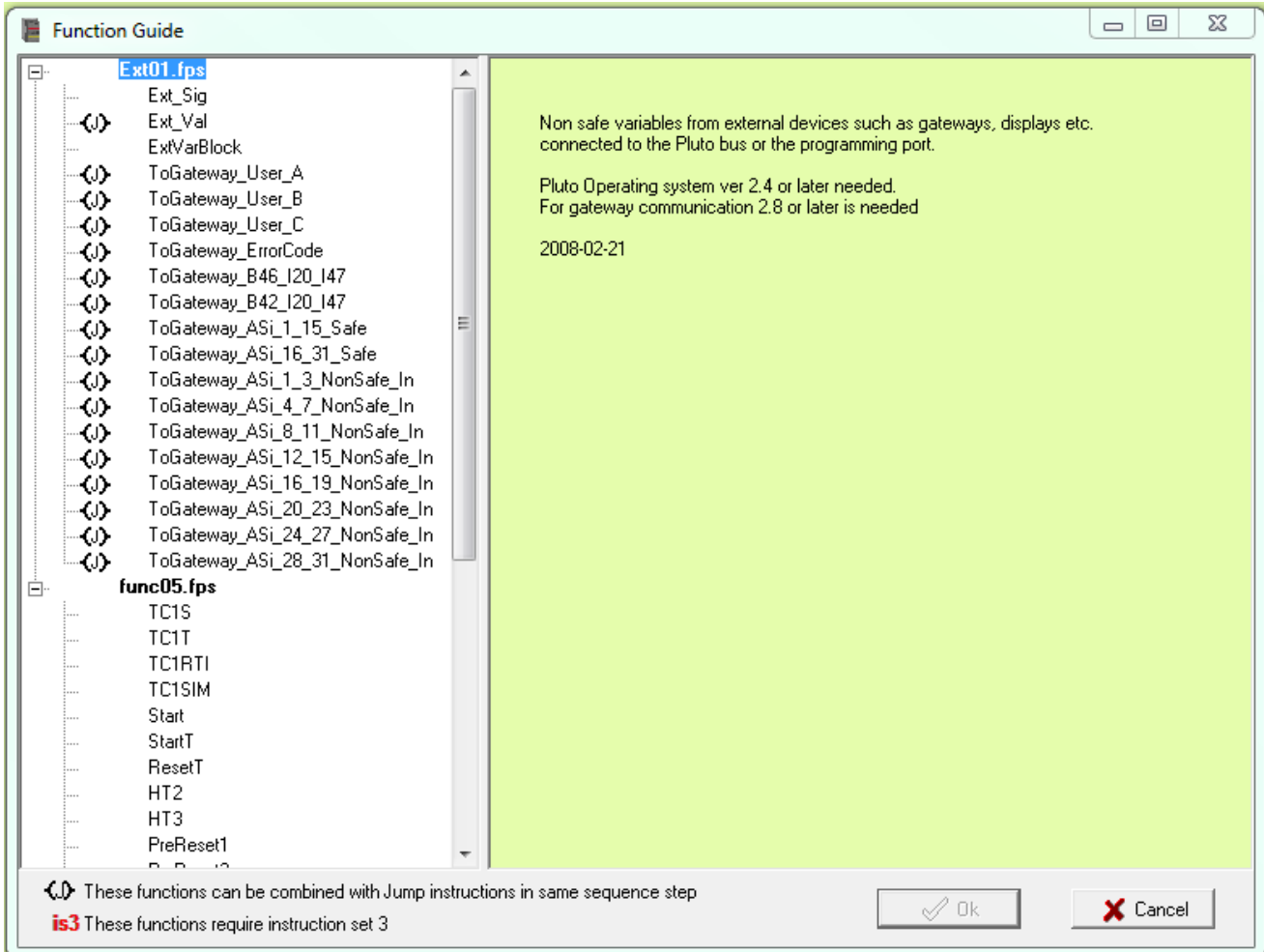
In order to send these extra inputs on the Pluto bus a special function (ToGateway\_B46\_I20\_I47) from the “ext01.fps” library must be used. For Qx.4 and Qx.5 the function “ToGateway\_User\_B” could be used to send them as bits for example.

The global data for Pluto-AS-i varies from the other Pluto members. See the Pluto Gateway manual.

### 3.2.2 Transmit other data from Pluto

In order to transmit other data (registers, bits, inputs and outputs) in addition to the global data on the Pluto bus, functions from the “ext01.fps” must be used. These were added under “Selecting the function Library”.

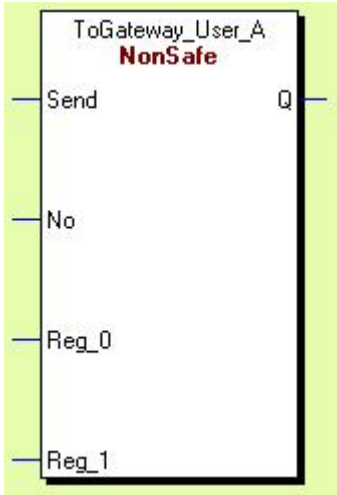
#### Components of the Function library “ext01.fps”:



## Block description:

The following text describes the function blocks used to transmit data to the super ordinate system from the Pluto bus, through the gateway, on the Profibus and to the Mitsubishi PLC.

### 3.2.2.1 ToGateway\_User\_A:



#### Render it possible to send two freely chosen registers.

##### Input variables:

**Send:** When "1" data is transmitted.

**No:** Number used in the "GX configurator", slave user parameters, (ToGateway\_UserNumber\_X, X=1-99) to identify the data received. It must be unique and used only once by any "ToGateway" block in the Pluto using the "No" pin, where "No" is a number ranging from 1-99.

**Reg\_0:** Addressing if the 1<sup>st</sup> register (R or SR register) to be transmitted.

**Reg\_1:** Addressing if the 2<sup>nd</sup> register (R or SR register) to be transmitted.

##### Output variables:

**Q:** Output is "1" during transmission.

##### Inputs in the Mitsubishi PLC:

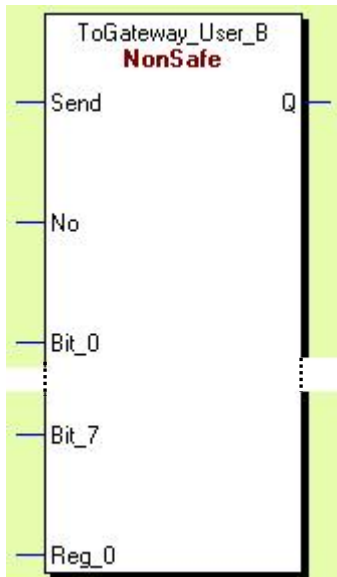
Byte0 = Reg\_0 low byte

Byte1 = Reg\_0 high byte

Byte2 = Reg\_1 low byte

Byte3 = Reg\_1 high byte

### 3.2.2.2 ToGateway\_User\_B:



#### Render it possible to send eight freely chosen bits and one freely chosen Register, plus the Pluto unit's error code.

##### Input variables:

**Send:** When "1" data is transmitted.

**No:** Number used in the "GX configurator", slave user parameters, (ToGateway\_UserNumber\_X, X=1-99) to identify the data received. It must be unique and used only once by any "ToGateway" block in the Pluto using the "No" pin, where "No" is a number ranging from 1-99.

**Bit\_0 to Bit\_7:** Addressing of up to eight bit variables (I, Q, M, SM) to be transmitted.

**Reg\_0:** Addressing if the register (R or SR register) to be transmitted.

##### Output variables:

**Q:** Output is "1" during transmission.

##### Inputs in the Mitsubishi PLC:

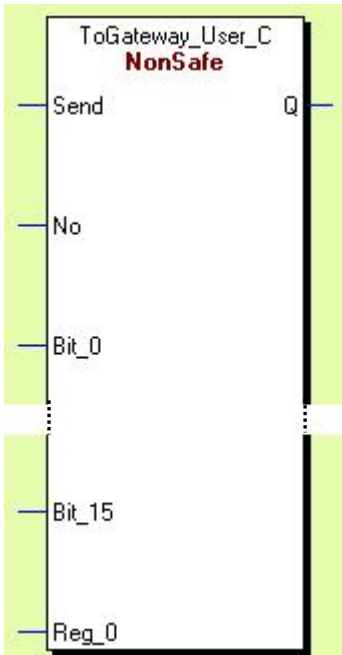
Byte0 = Reg\_0 low byte

Byte1 = Reg\_0 high byte,

Byte2 = Bit\_7, Bit\_6, Bit\_5, Bit\_4, Bit\_3, Bit\_2, Bit\_1, Bit\_0

Byte3 = Error Code

### 3.2.2.3 ToGateway\_User\_C:



**Render it possible to send sixteen freely chosen bits and one freely chosen register.**

**Input variables:**

**Send:** When "1" data is transmitted.

**No:** Number used in the "GX configurator", slave user parameters, (ToGateway\_UserNumber\_X, X=1-99) to identify the data received. It must be unique and used only once by any "ToGateway" block in the Pluto using the "No" pin, where "No" is a number ranging from 1-99.

**Bit\_0 to Bit\_15:** Addressing of up to sixteen bit variables (I, Q, M, SM) to be transmitted.

**Reg\_0:** Addressing if the 1<sup>st</sup> register (R or SR register) to be transmitted.

**Output variables:**

**Q:** Output is "1" during transmission.

**Inputs in the Mitsubishi PLC:**

Byte0 = Reg\_0 low byte

Byte2 = Bit\_7, Bit\_6, Bit\_5, Bit\_4, Bit\_3, Bit\_2, Bit\_1, Bit\_0

Byte1 = Reg\_0 high byte

Byte3 = Bit\_15, Bit\_14, Bit\_13, Bit\_12, Bit\_11, Bit\_10, Bit\_9, Bit\_8.

### 3.2.2.4 ToGateway\_ErrorCode:



**Render it possible to send the Pluto unit's error code.**

**Input variables:**

**Send:** When "1" data is transmitted.

**No:** In GX configurator, slave user parameters, use "ToGateway\_ErrorCode".

**Output variables:**

**Q:** Output is "1" during transmission.

**Inputs in the Mitsubishi PLC:**

Byte0 = not used

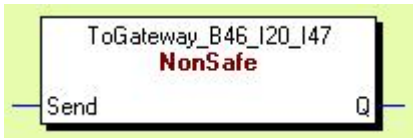
Byte1 = not used

Byte2 = not used

Byte3 = Error Code



### 3.2.2.5 ToGateway\_B46\_I20\_I47:



**Render it possible to send the inputs not included in the global data from the B46-6.**

**Only used when needed when working with the B46-6!**

**Input variables:**

**Send:** When "1" data is transmitted.

**No:** In GX configurator, slave user parameters, use "ToGateway\_B46\_I20\_I47".

**Output variables:**

**Q:** Output is "1" during transmission.

**Inputs in the Mitsubishi PLC:**

Byte0 = Ix.27, Ix.26, Ix.25, Ix.24, Ix.23, Ix.27, Ix.21, Ix.20,

Byte1 = Ix.37, Ix.36, Ix.35, Ix.34, Ix.33, Ix.37, Ix.31, Ix.30,

Byte2 = Ix.47, Ix.46, Ix.45, Ix.44, Ix.43, Ix.42, Ix.41, Ix.40,

Byte3 = Error Code

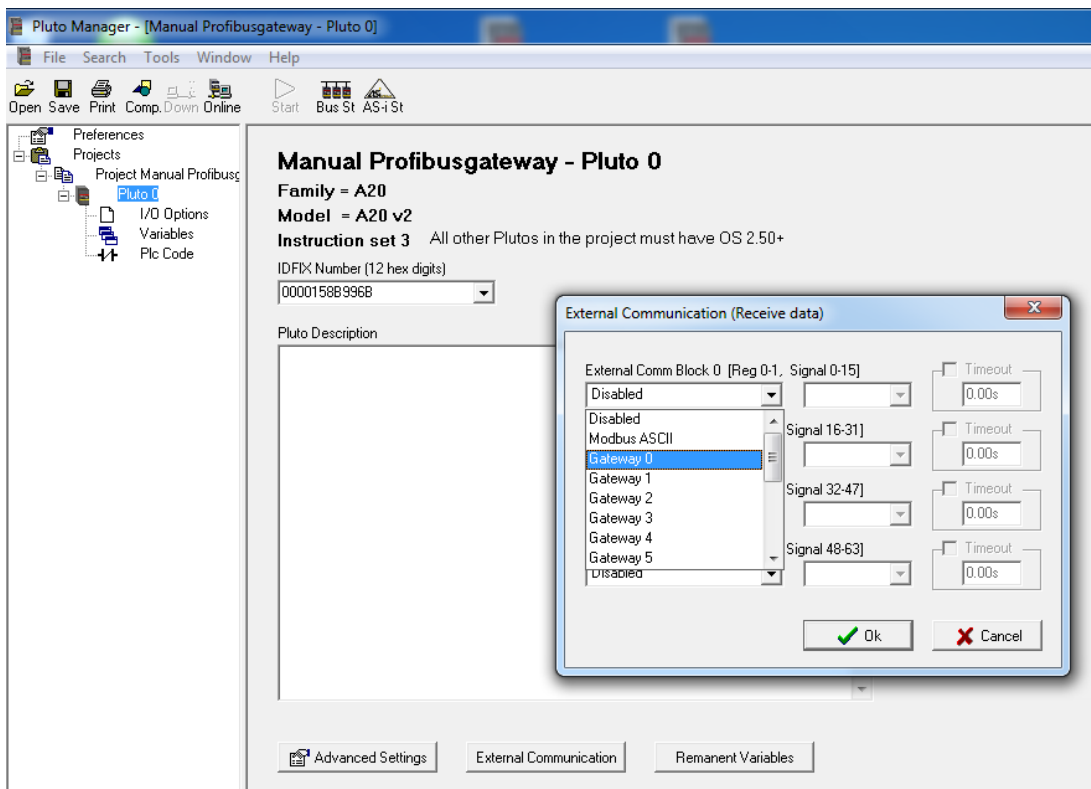
### 3.3 Transmitting from the Mitsubishi PLC to Pluto

#### 3.3.1 Setup External Communication in Pluto Manager

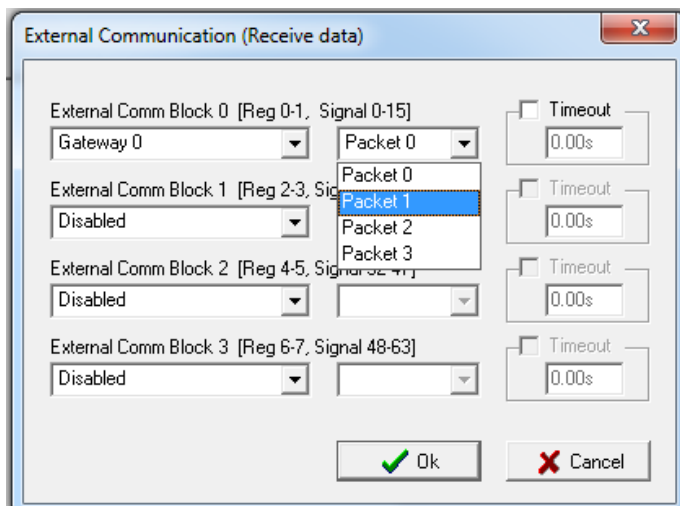
In a Pluto network the maximum number of Pluto safety PLC units possible to connect is 32. Added to that is up to four gateways. Each gateway can transmit 24 bytes of data divided into four packets of six bytes in each. A packet that the gateway receives from the super ordinate system is transmitted on to the Pluto bus. The Pluto that wishes to receive a certain packet must be configured so that packet ends up in an “External Comm Block”.

The following pictures explain how to setup the Pluto unit to receive data from the super ordinate PLC unit through the gateway.

#### Selecting the gateway:



#### Selecting the packet:



#### Selecting the gateway and packets received from it.

In order to setup the Pluto PLC to receive data from a gateway the gateway's address must be set. Which packet from the chosen gateway to be received must also be chosen and mapped to the Comm Block the user wish it to end up in.

It is possible to choose between up to four gateways, 0-3. Each gateway can send up to four packets.

It is therefore possible to differentiate the gateways and the packets.

After this setup no further configuration is necessary in the Pluto to receive external data.

### 3.3.2 Receive Data in Pluto

Below is described which blocks can be used to receive data from the super ordinate system, via the Profibus, through the gateway and over the Pluto Bus.

*Data transmitted to the Pluto unit is split into four External Comm Blocks, each Comm Block containing 16 data bits and two 16 bit registers. Comm Block zero contains bits 0-15 and registers 0 and 1, Comm Block one contains bits 16-31 and registers 2 and 3, Comm Block two contains bits 32-47 and registers 4 and 5, Comm Block three contains bits 48-63 and registers 6 and 7.*

#### Block description:

##### 3.3.2.1 Ext\_Sig:



**The block reads one bit variable from the Profibus gateway, written to the gateway by the super ordinate system.**

**Input variables:**

**VarNo:** A number ranging from 0-63, note which bit number belongs to which "External Comm Block" and also which packet was configured to end up in this Block.

**PostClear:** PostClear sets the output "Q" to 0 in the next PLC cycle. If it is unconditionally set "Q" will follow what the external device write to VarNo.

**Output variables:**

**Q:** Q is the output and can control an M, GM or Q according to what the external device transmit.

##### 3.3.2.2 Ext\_Val:



**The block reads 16 bits from the Profibus gateway, written to the gateway by the super ordinate system.**

**Input variables:**

**VarNo:** A number between 0-7, note which register number belongs to which "External Comm Block" and also which packet was configured to end up in this Block.

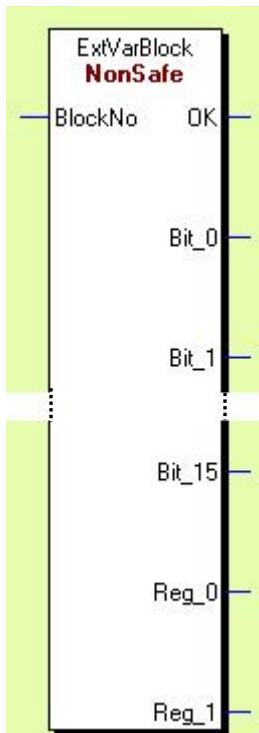
**PostClear:** PostClear sets the output "Value" to 0 in the next PLC cycle. If it is unconditionally set "Value" will follow what the external device write to VarNo.

**Output variables:**

**OK** Dummy Bit which is normally "1". It must be connected to an M, GM or Q.

**Value** Value is the output received from the external device and must be connected to a Register R.

### 3.3.2.3 ExtVarBlock:



The block reads the whole packet received into an “External Comm Block” from the gateway, written to the gateway by the super ordinate system.

**Input variables:**

**BlockNo:** A number between 0-3 corresponding to the External Comm Block that is setup in PlutoManager.

**Output variables:**

**OK:** Dummy Bit which is normally “1”. It must be connected to an M, GM or Q.

**Bit\_0 to Bit\_15:** The bits included in the Comm block, it must be connected to an M, GM or Q.

**Reg\_0:** The first register included in the Comm block. It must be written to a register R.

**Reg\_1:** The second register included in the Comm block. It must be written to a register R.

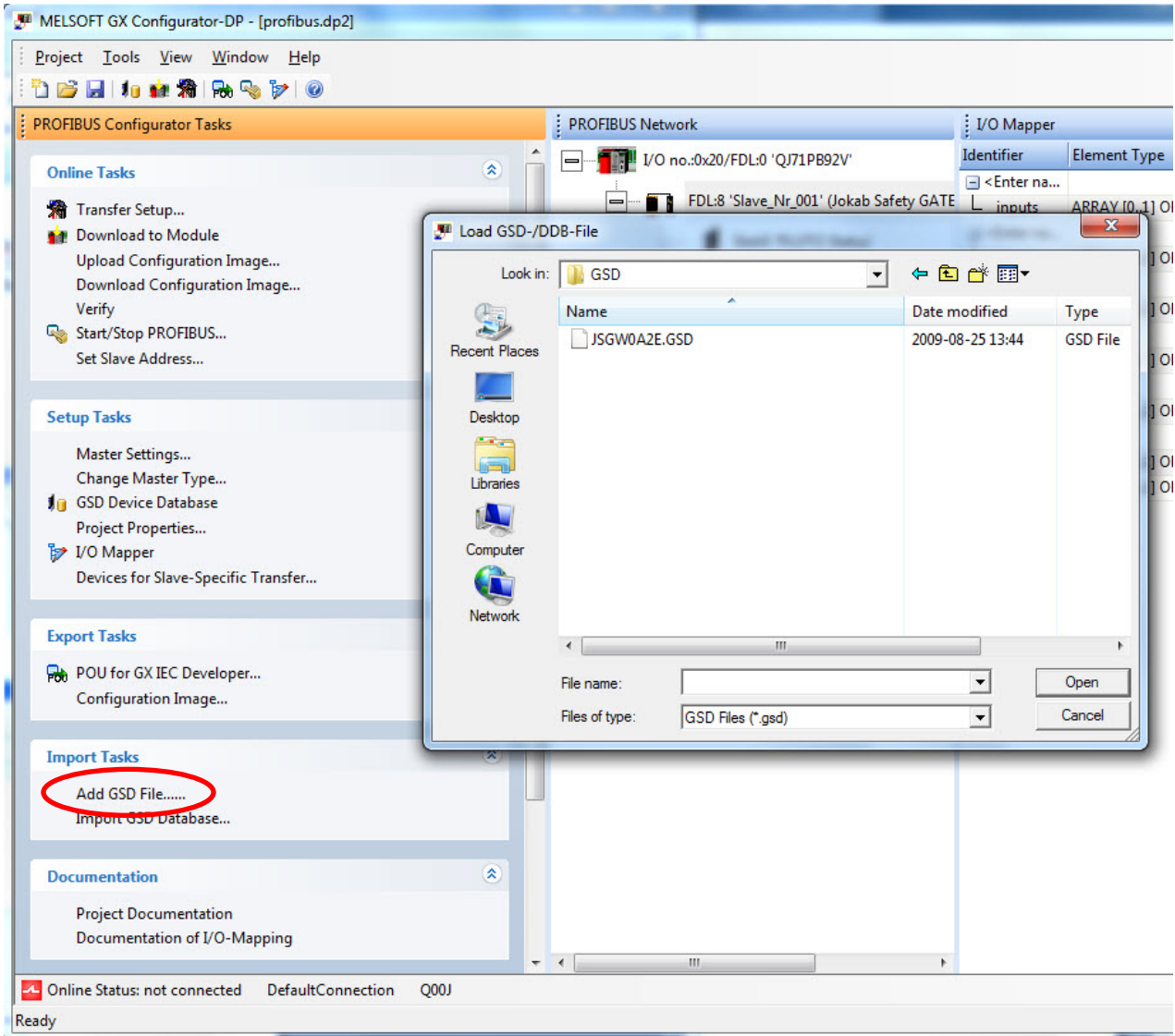
## 4 Setup in GX Configurator DP

This chapter will describe how to setup and use the GSD file in GX Configurator DP. The GSD-file for the gateway is located on the disc enclosed in the package with the gateway. GSD revision 3 version 2 should do for most applications. For further information about the different versions, see the disc.

### 4.1 Setup the HW Config

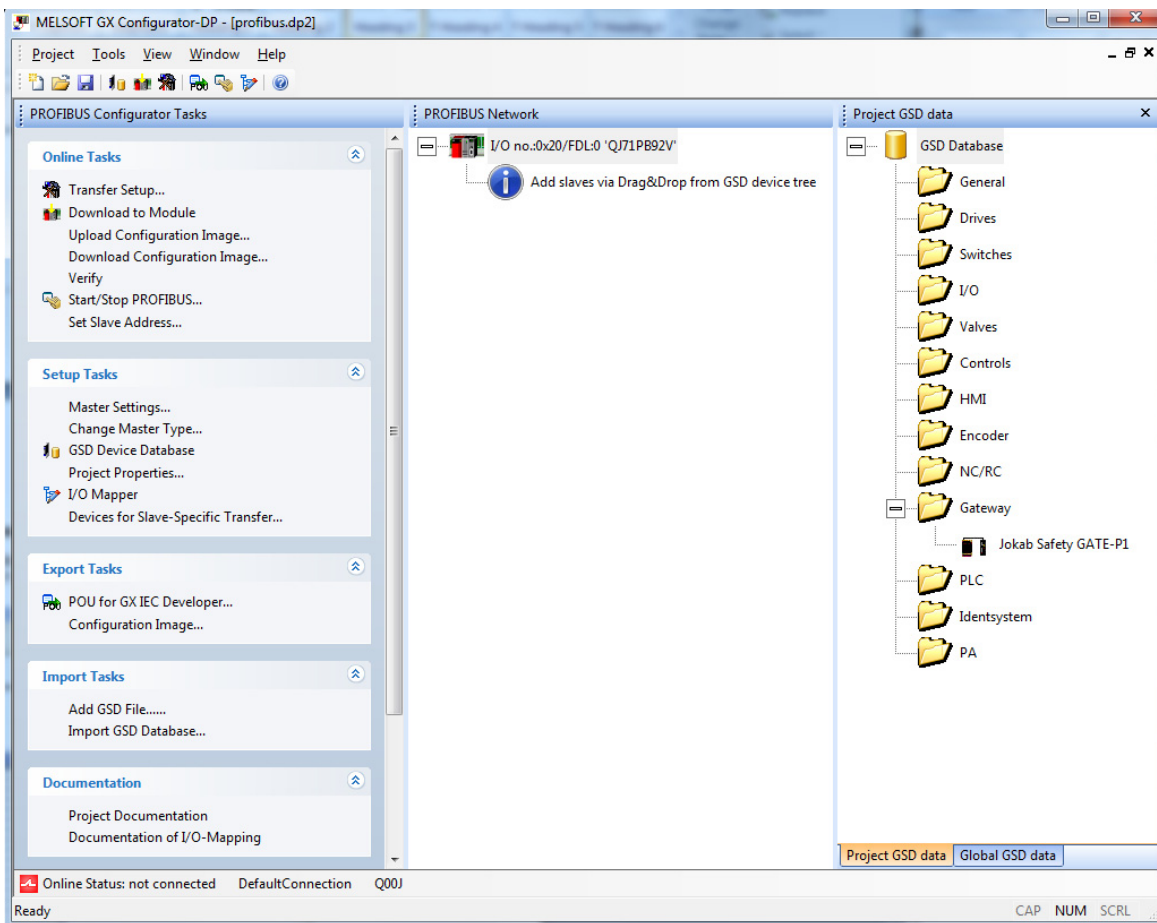
#### 4.1.1 GSD-file selection and installation

Click “Add GSD file”, then browse to where the GSD file is located.



## 4.1.2 Gateway selection and connection

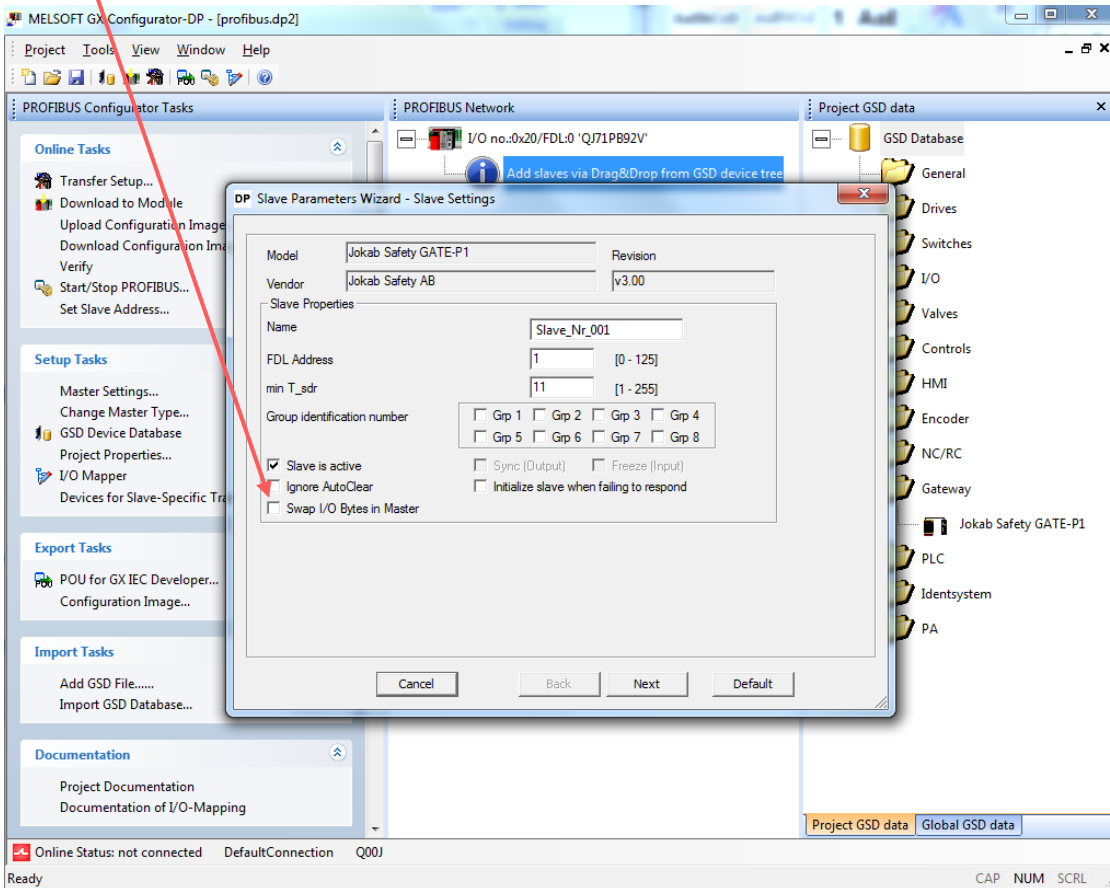
The GSD file should be installed in the gateway folder, just drag and drop.



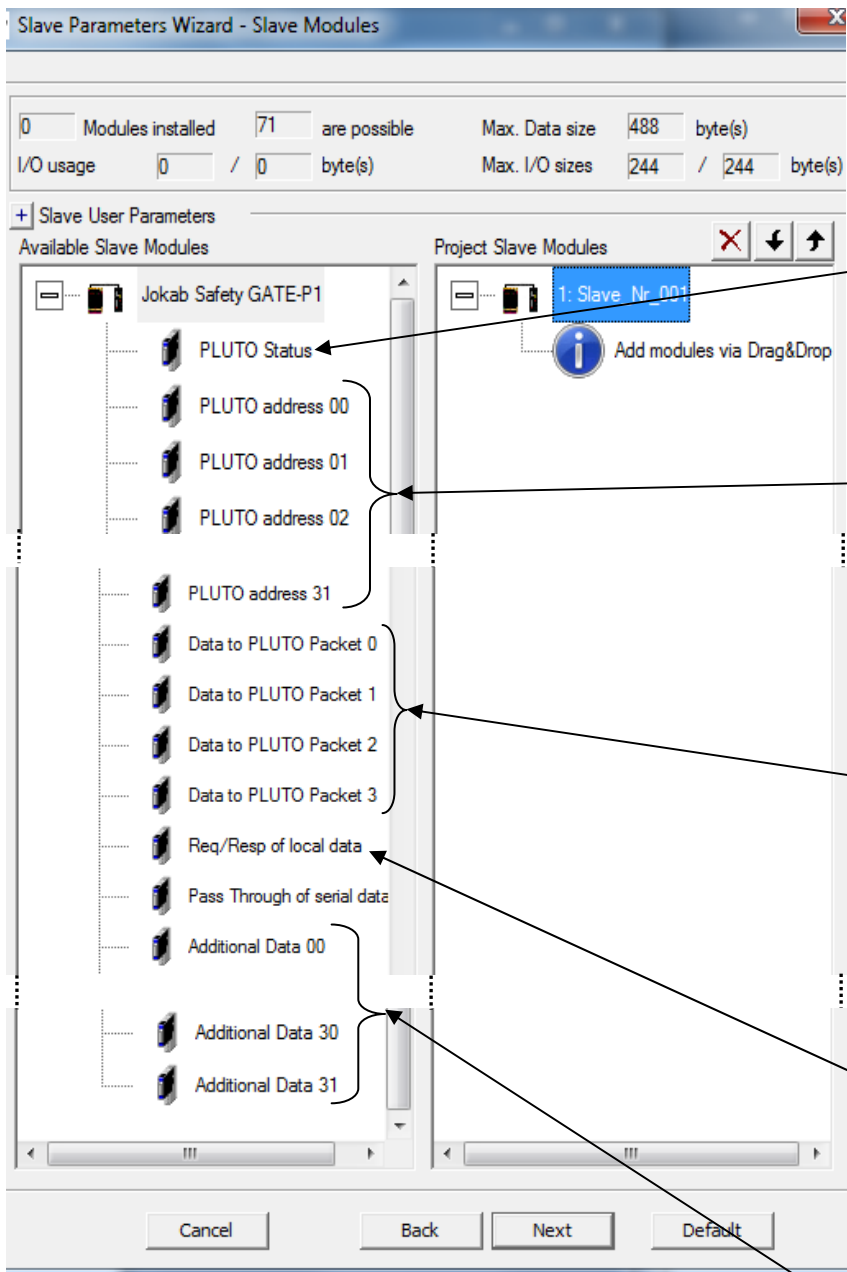
### 4.1.2.1 Configuration options

When the GSD device is “dropped” this window should appear. Here you give the gateway a name and a node address (FDL Adress).

Note: if you mark “Swap I/O Bytes in Master” the function blocks for GX IEC Developer will produce faulty data.



Click next.



This picks up a status message that is always transmitted on the Pluto bus. It contains information about which Pluto units are active on the bus. It is 32 bits long where each bit corresponds to each Pluto unit active. A set bit means an active Pluto unit.

Send from the specified Pluto its global data to the super ordinate system.  
 Example:  
 PLUTO address 05 will send what global data Pluto unit 5 is sending over the Pluto bus to the gateway, to be received by the Mitsubishi PLC.

The four packets available that the super ordinate system can send to the Pluto bus through the gateway.  
 Note that each packet is unique and should be used only once!

See the Gateway manual, available e.g. under "Help-> Gateway->Pluto Gateway Manual" in Pluto Manager,

A number of 32 Additional Data posts available.  
 Note that each one is unique and should be used only once!  
 It does not correspond to the Pluto unit's number.



#### 4.1.2.2 Req/Resp of local data

This requires a special procedure to be used described more thoroughly in the Gateway Manual.

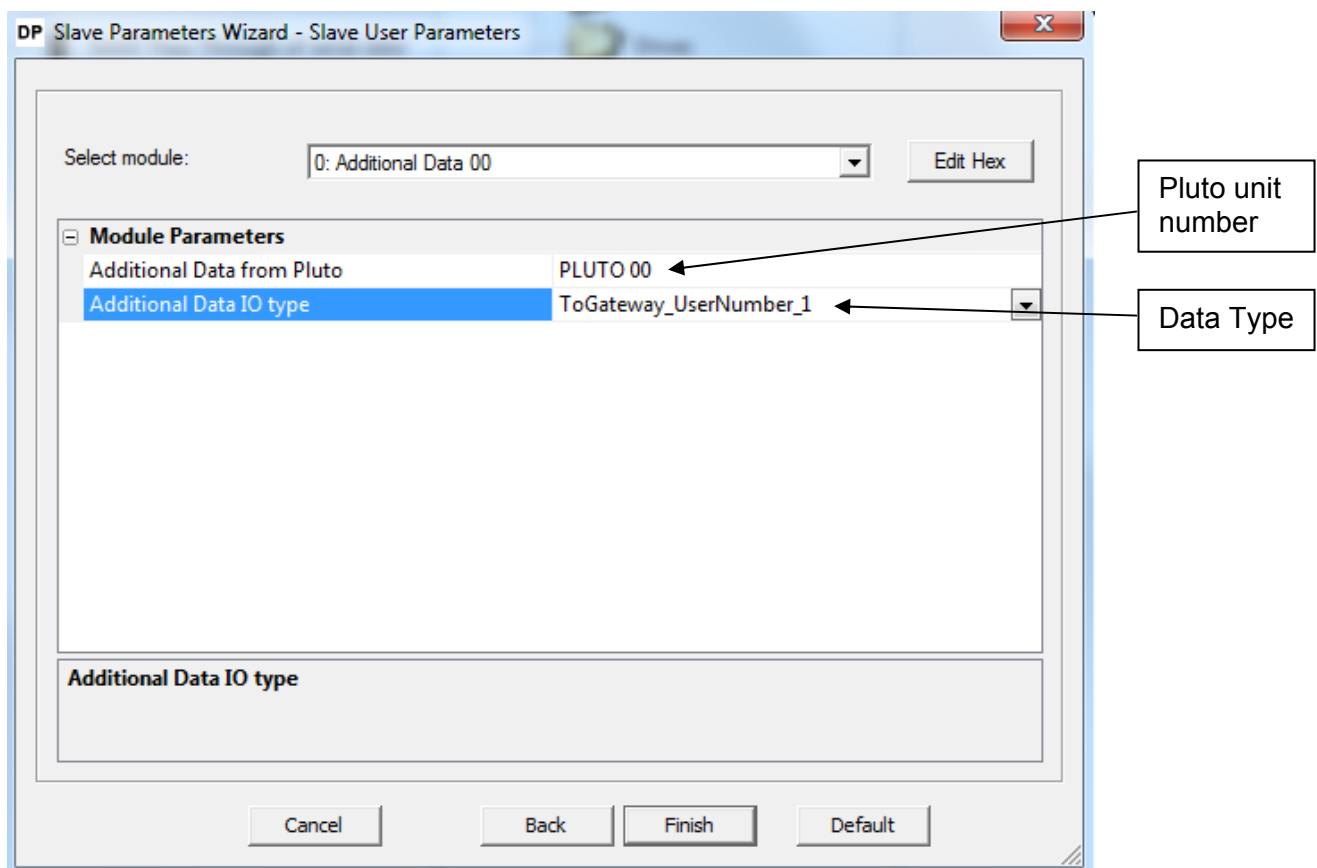
#### 4.1.2.3 Additional Data 0-31

There are 32 available slots for Addition Data that the super ordinate system can use to receive data from the different Pluto units on the Pluto bus through the gateway. The numbers 0-31 does not correspond to the Pluto unit's number; it is unique and should be used only once.

It can be set to receive different types of data from the different Pluto units on the Pluto bus. It must be specified which Pluto unit it is that is sending and what type of data.

The type can be:

- The Error code currently in the Pluto unit.
- The inputs not included in the global data transmitted on the Pluto bus inside a Pluto B46.
- A number of safe and non safe inputs from an AS-i Pluto.
- A user defined additional data block with a unique number ranging from 0-99. This number is also used in the Pluto unit so that each system can identify the data. Note that only 32 additional data blocks are available but they can be numbered 0-99.



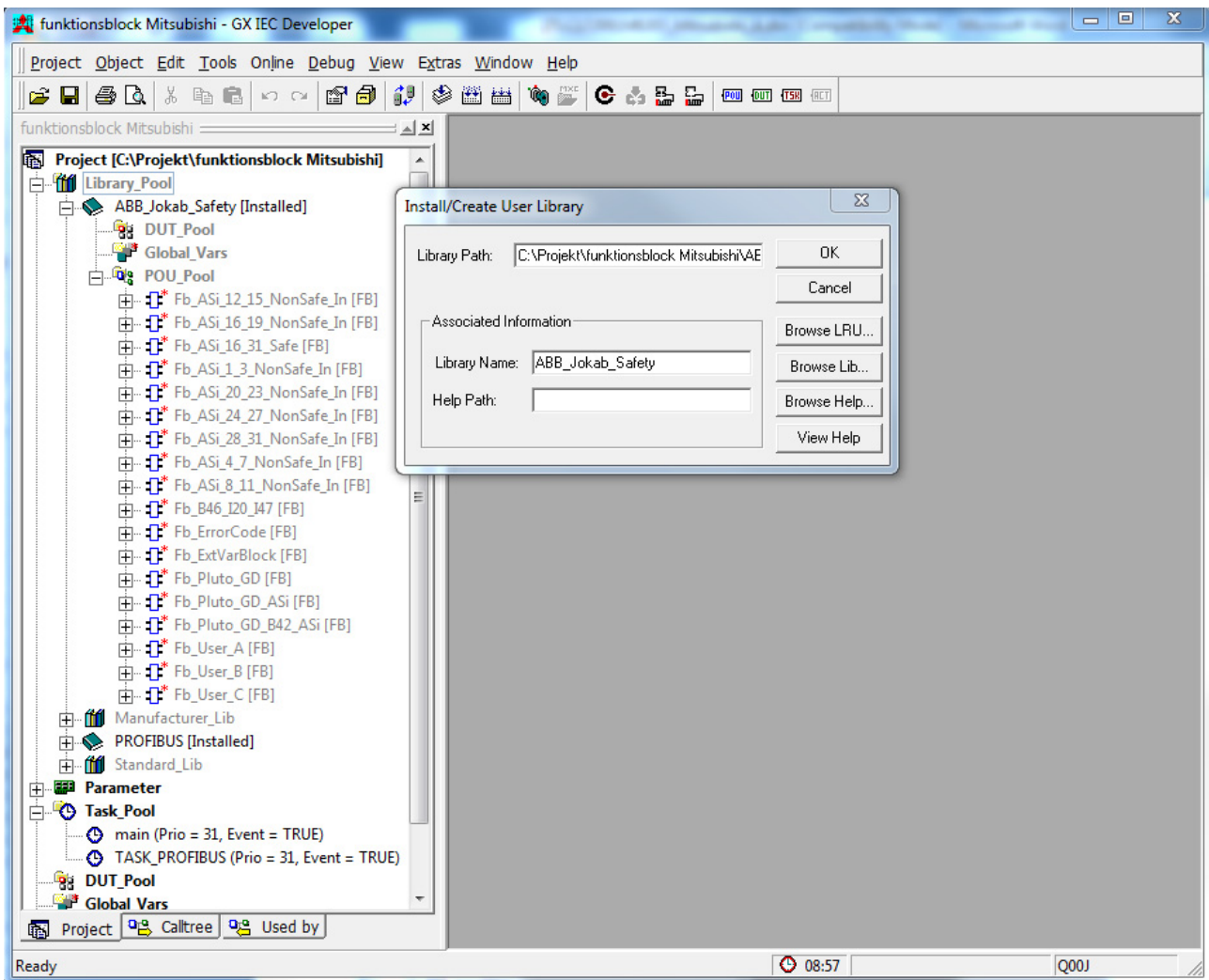
## 4.2 Jokab function block library

Included on the disc provided with the Gateway there is a function library called “ABB\_Jokab\_Safety.sul”. It is open and fully modifiable and provided for free. They are to be used “as is”.

### 4.2.1 Installation

In GX IEC Developer project tree, mark “Library\_Pool” and “right click” choose “Install/Create user library”. Click “Browse Lib”, select the file “ABB\_Jokab\_Safety.sul” and click “OK”.

The library “ABB\_Jokab\_Safety” can now be viewed in the “Library\_Pool”.



### 4.2.2 Use

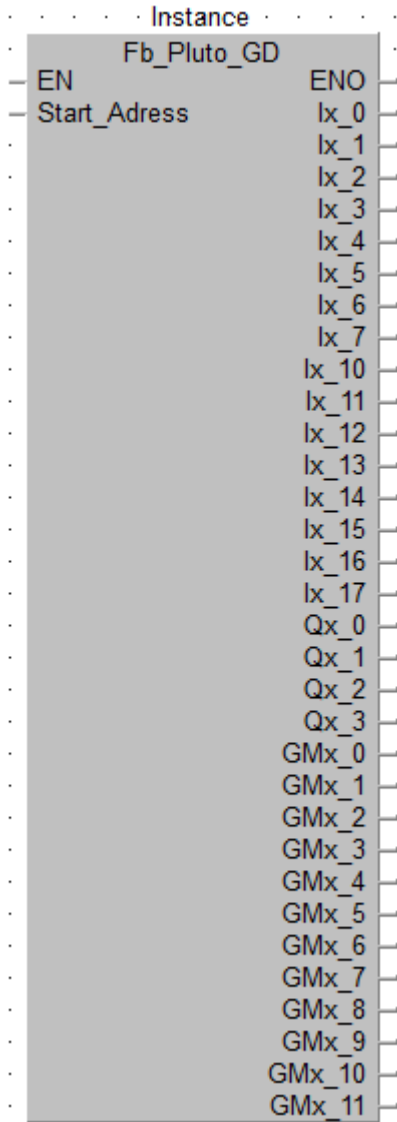
The blocks will now be available in the program editor.

### 4.2.3 Description of function blocks

Below follows a description of the function blocks available in the library.

#### 4.2.3.1 Function block - Global data from Pluto (read)

This block is used with non AS-i plutos.



<b>Input</b>	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for inputs from the hardware configuration in GX configurator DP. Array of 32 bool.
<b>Output</b>	
<b>lx_0 To lx_17:</b>	Inputs from Pluto, x= Pluto node nr (Boolean).
<b>Qx_0 To Qx_3:</b>	Safety outputs from Pluto, x= Pluto node nr (Boolean).
<b>GMx_0 To GMx_11:</b>	Global memories from Pluto, x= Pluto node nr (Boolean).
<b>ENO:</b>	Enable output from FB (Boolean).

#### 4.2.3.2 Function block - Global data from Pluto ASi (read)

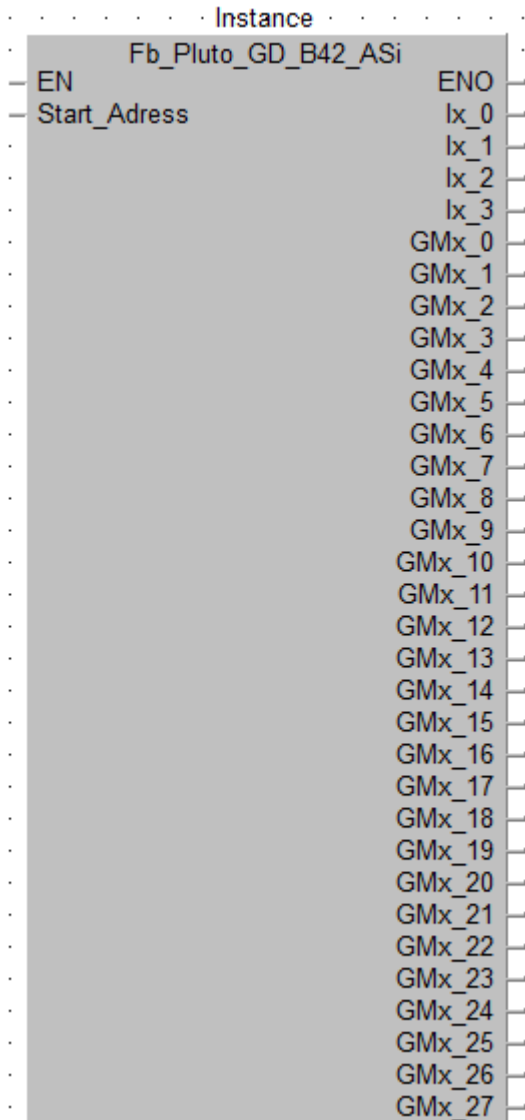
This block is used with the pluto AS-i.  
No corresponding programming is needed in Pluto.

Instance	
Fb_Pluto_GD_ASi	
EN	ENO
Start_Address	Ix_0
	ASix_1
	ASix_2
	ASix_3
	ASix_4
	ASix_5
	ASix_6
	ASix_7
	ASix_8
	ASix_9
	ASix_10
	ASix_11
	ASix_12
	ASix_13
	ASix_14
	ASix_15
	Qx_0
	Qx_1
	Qx_2
	Qx_3
	GMx_0
	GMx_1
	GMx_2
	GMx_3
	GMx_4
	GMx_5
	GMx_6
	GMx_7
	GMx_8
	GMx_9
	GMx_10
	GMx_11

Input	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for outputs from the hardware configuration in GX configurator DP. Array of 32 bool.
Output	
<b>Ix_0:</b>	Input from Pluto, x= Pluto node nr (Boolean).
<b>ASix_1 – ASix_15:</b>	Pluto AS-i local safety AS-i slave. x= Pluto node nr (Boolean).
<b>Qx_0 - Qx_3:</b>	Safety outputs from Pluto, x= Pluto node nr (Boolean).
<b>GMx_0 - GMx_11:</b>	Global memories from Pluto, x= Pluto node nr (Boolean).
<b>ENO:</b>	Enable output from FB (Boolean).

### 4.2.3.3 Function block - Global data from Pluto B42 ASi (read)

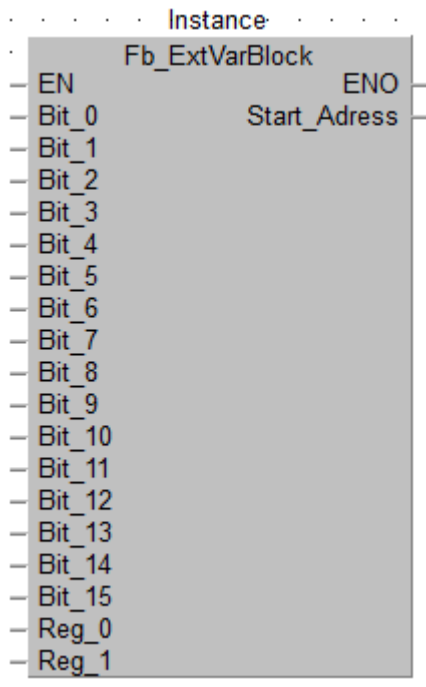
This block is used with the pluto B42 AS-i.  
No corresponding programming is needed in Pluto.



Input	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for outputs from the hardware configuration in GX configurator DP. Array of 32 bool.
Output	
<b>lx_0 – lx_3:</b>	Inputs from Pluto, x= Pluto node nr (Boolean).
<b>GMx_0 - GMx_27:</b>	Global memories from Pluto, x= Pluto node nr (Boolean).
<b>ENO:</b>	Enable output from FB (Boolean).

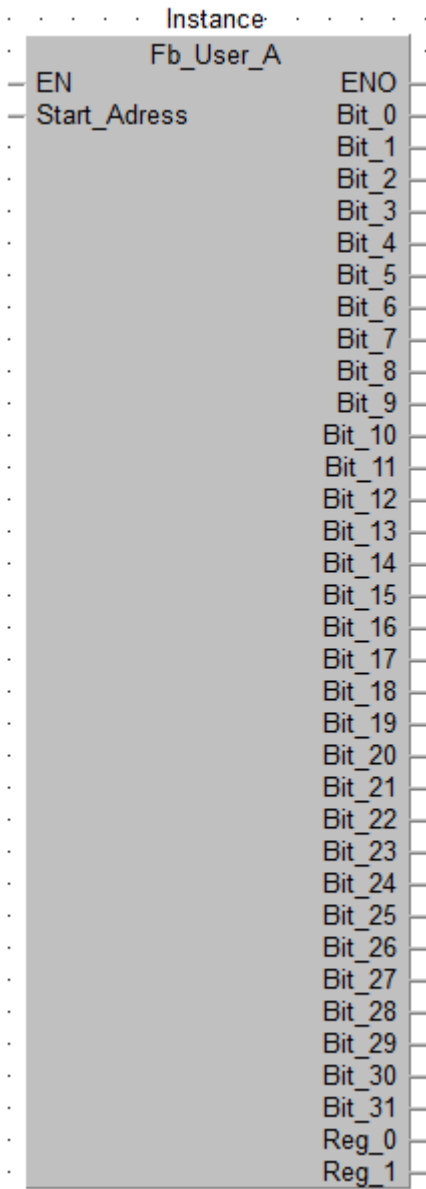
#### 4.2.3.4 Function block - Data to Pluto (write)

Corresponding programming is needed in Pluto. See “Transmitting from the Mitsubishi PLC to the Pluto”.



Input	
<b>EN:</b>	Enables or disables the complete block.
<b>Bit_0 to Bit_15:.</b>	Connect to a Boolean variable and send to Pluto. If not connected to a variable 0 (False) is default value (Boolean)
<b>Reg_0 and Reg_1:.</b>	Connect to a integer variable and send to Pluto. If not connected to a variable 0 is default value (Integer).
Output	
<b>Start_Adress:</b>	Start address for outputs from the hardware configuration in GX configurator DP. Array of 48 bool.
<b>ENO:</b>	Enable output from FB (Boolean).

#### 4.2.3.5 Function block – Additional data – USER A (read)

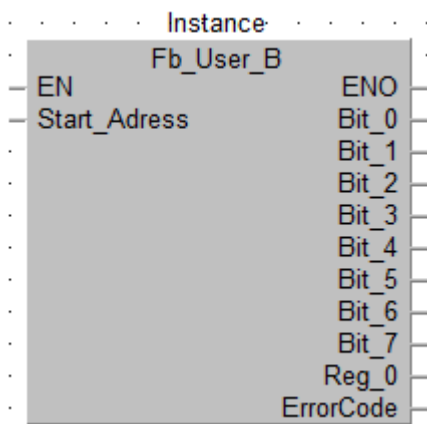


Corresponding programming is needed in Pluto. See “Transmit other data from the Pluto” or Manual Pluto Gateway chapter “Additional data”.

This block will receive user defined 32 bit value from Pluto. The variables can be used either as 32 bits or two 16 bits register. Bits 0-15 are the same as in Reg\_0, bits 16-31 are the same as in Reg\_1.

Input	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for inputs from the hardware configuration in GX configurator DP. Array of 32 bool.
Output	
<b>Bit0 – Bit31</b>	32 bits user defined data from Pluto (Boolean).
<b>Reg0, Reg1</b>	16 bits user defined data from Pluto (integer).
<b>ENO:</b>	Enable output from FB (Boolean).

#### 4.2.3.6 Function block – Additional data – USER B (read)



Corresponding programming is needed in Pluto.

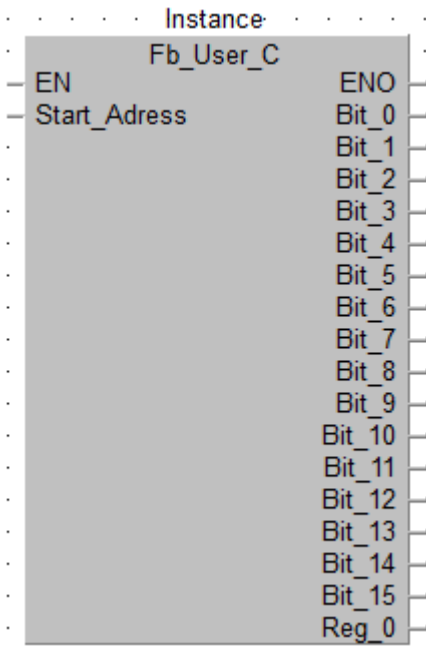
See “Transmit other data from the Pluto” or Manual Pluto Gateway chapter “Additional data”.

This block will receive user defined 8 bit value, 16 bits register and error code from Pluto.

Input	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for inputs from the hardware configuration in GX configurator DP. Array of 32 bool.
Output	
<b>Bit0 – Bit7</b>	8 bits user defined data from Pluto (Boolean).
<b>Reg_0</b>	16 bits user defined register data from Pluto (Integer).
<b>ErrorCode</b>	Pluto error code value (Byte).
<b>ENO:</b>	Enable output from FB (Boolean).



#### 4.2.3.7 Function block – Additional data – USER C (read)

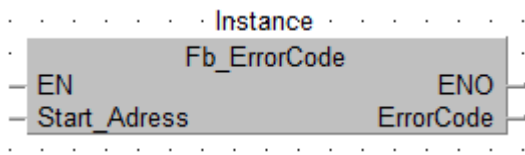


Corresponding programming is needed in Pluto. See “Transmit other data from the Pluto” or Manual Pluto Gateway chapter “Additional data”.

This block will receive user defined 16 bits value and 16 bits register from Pluto.

Input	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for inputs from the hardware configuration in GX configurator DP. Array of 32 bool.
Output	
<b>Bit0 – Bit15</b>	16 bits user defined data from Pluto (Boolean).
<b>Reg_0</b>	16 bits user defined register data from Pluto (Integer).
<b>ENO:</b>	Enable output from FB (Boolean).

#### 4.2.3.8 Function block – Additional data – Error code (read)

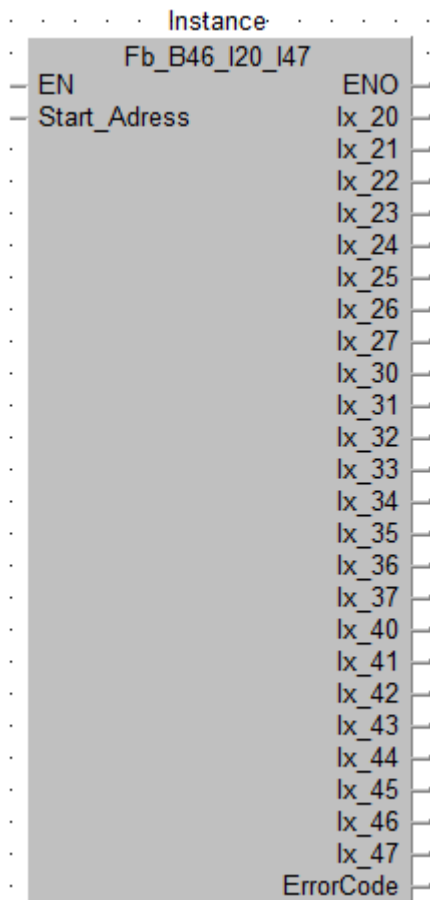


Corresponding programming is needed in Pluto.  
See “Transmit other data from the Pluto” or Manual Pluto Gateway chapter “Additional data”.

This block will receive error code from Pluto.

<b>Input</b>	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for inputs from the hardware configuration in GX configurator DP. Array of 32 bool.
<b>Output</b>	
<b>Error_code</b>	Pluto error code value (Byte).
<b>ENO:</b>	Enable output from FB (Boolean).

#### 4.2.3.9 Function block – Additional data – B46 I20-I47 (read)



Corresponding programming is needed in Pluto. See “Transmit other data from the Pluto” or Manual Pluto Gateway chapter “Additional data”.

This block will receive Pluto B46 local data I20 – I47 and error code from Pluto.

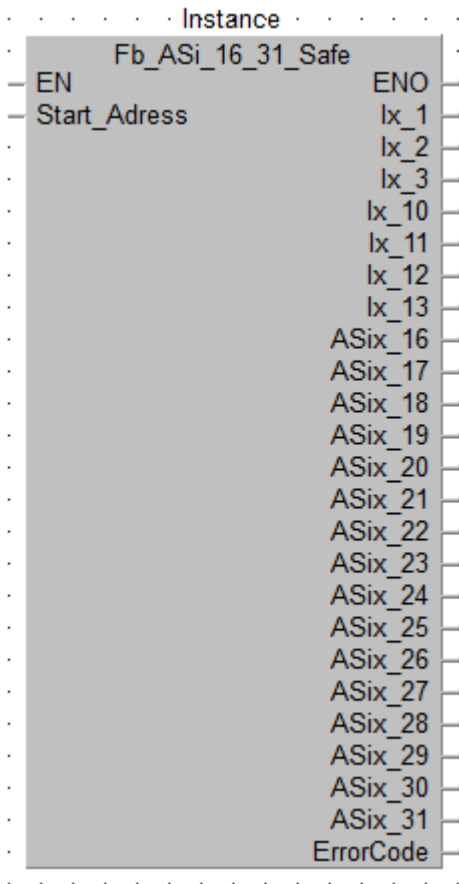
Input	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for inputs from the hardware configuration in GX configurator DP. Array of 32 bool.
Output	
<b>lx_20 – lx47</b>	Pluto B46 local inputs I20 – I47(Boolean), x= Pluto node nr.
<b>Error_code</b>	Pluto error code value (Byte).
<b>ENO:</b>	Enable output from FB (Boolean).

#### 4.2.3.10 Function block – Additional data – ASi 16-31 safe (read)

Corresponding programming is needed in Pluto.

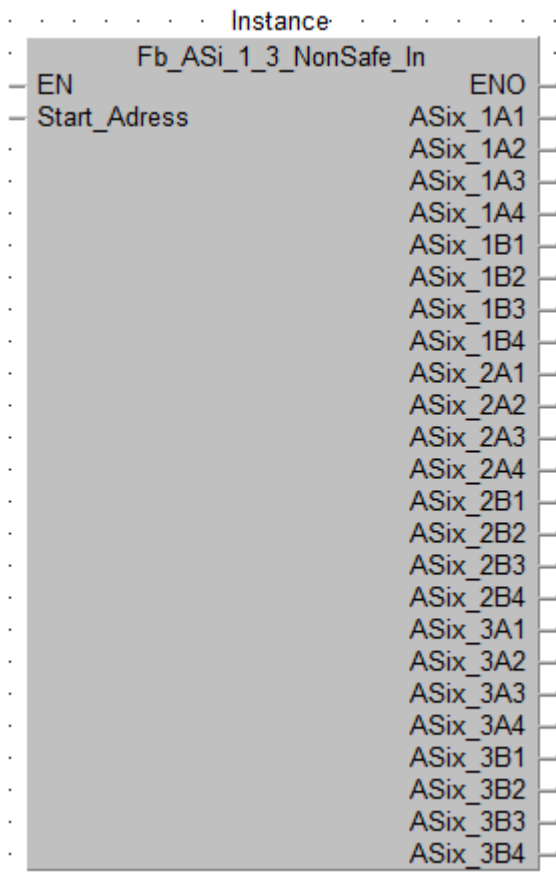
See “Transmit other data from the Pluto” or Manual Pluto Gateway chapter “Additional data”.

This block will receive Pluto AS-i local inputs 1 – 13, AS-i safety slave 16 – 31 and Pluto error code.



Input	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for inputs from the hardware configuration in GX configurator DP. Array of 32 bool.
Output	
<b>lx1 – lx13</b>	Pluto AS-i local inputs. x= Pluto node nr (Boolean).
<b>ASix_16 – ASix_31</b>	Pluto AS-i local safety AS-i slave. x= Pluto node nr (Boolean).
<b>Error_code</b>	Pluto error code value (Byte).
<b>ENO:</b>	Enable output from FB (Boolean).

#### 4.2.3.11 Function block – Additional data – ASi 1-3 non safe (read)



Corresponding programming is needed in Pluto. See “Transmit other data from the Pluto” or Manual Pluto Gateway chapter “Additional data”.

This block will receive data from Pluto AS-i local non safe AS-i slave address 1 – 3.

<b>Input</b>	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for inputs from the hardware configuration in GX configurator DP. Array of 32 bool.
<b>Output</b>	
<b>ASix_1A1 – ASix_3A4</b>	Pluto AS-i local non safe AS-i standard and extended A slave (Boolean). x= Pluto node nr.
<b>ASix_1B1 – ASix_3B4</b>	Pluto AS-i local non safe AS-i extended B slave (Boolean). x= Pluto node nr.
<b>ENO:</b>	Enable output from FB (Boolean).

#### 4.2.3.12 Function block – Additional data – ASi 4-7 non safe (read)

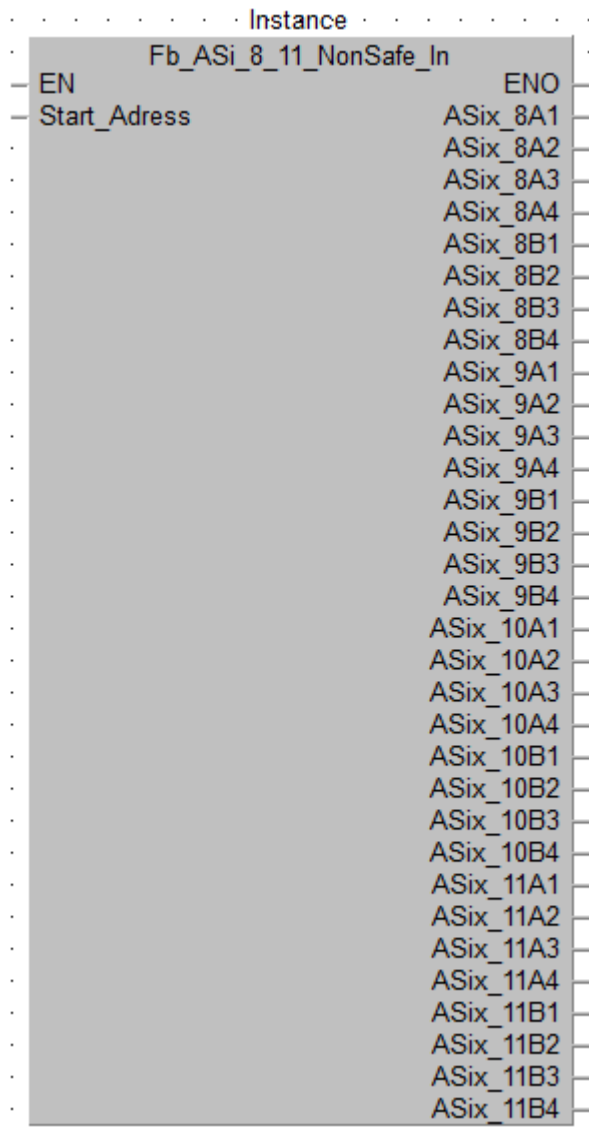
Instance	
Fb_ASi_4_7_NonSafe_In	
EN	ENO
Start_Address	ASix_4A1
	ASix_4A2
	ASix_4A3
	ASix_4A4
	ASix_4B1
	ASix_4B2
	ASix_4B3
	ASix_4B4
	ASix_5A1
	ASix_5A2
	ASix_5A3
	ASix_5A4
	ASix_5B1
	ASix_5B2
	ASix_5B3
	ASix_5B4
	ASix_6A1
	ASix_6A2
	ASix_6A3
	ASix_6A4
	ASix_6B1
	ASix_6B2
	ASix_6B3
	ASix_6B4
	ASix_7A1
	ASix_7A2
	ASix_7A3
	ASix_7A4
	ASix_7B1
	ASix_7B2
	ASix_7B3
	ASix_7B4

Corresponding programming is needed in Pluto. See “Transmit other data from the Pluto” or Manual Pluto Gateway chapter “Additional data”.

This block will receive data from Pluto AS-i local non safe AS-i slave address 4 – 7.

Input	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for inputs from the hardware configuration in GX configurator DP. Array of 32 bool.
Output	
<b>ASix_4A1 – ASix_7A4</b>	Pluto AS-i local non safe AS-i standard and extended A slave (Boolean). x= Pluto node nr.
<b>ASix_4B1 – ASix_7B4</b>	Pluto AS-i local non safe AS-i extended B slave (Boolean). x= Pluto node nr.
<b>ENO:</b>	Enable output from FB (Boolean).

#### 4.2.3.13 Function block – Additional data – ASi 8-11 non safe (read)



Corresponding programming is needed in Pluto. See “Transmit other data from the Pluto” or Manual Pluto Gateway chapter “Additional data”.

This block will receive data from Pluto AS-i local non safe AS-i slave address 8 – 11.

Input	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for inputs from the hardware configuration in GX configurator DP. Array of 32 bool.
Output	
<b>ASix_8A1 – ASix_11A4</b>	Pluto AS-i local non safe AS-i standard and extended A slave (Boolean). x= Pluto node nr.
<b>ASix_8B1 – ASix_11B4</b>	Pluto AS-i local non safe AS-i extended B slave (Boolean). x= Pluto node nr.
<b>ENO:</b>	Enable output from FB (Boolean).

#### 4.2.3.14 Function block – Additional data – ASi 12-15 non safe (read)

Instance	
Fb_ASi_12_15_NonSafe_In	
EN	ENO
Start_Address	ASix_12A1
	ASix_12A2
	ASix_12A3
	ASix_12A4
	ASix_12B1
	ASix_12B2
	ASix_12B3
	ASix_12B4
	ASix_13A1
	ASix_13A2
	ASix_13A3
	ASix_13A4
	ASix_13B1
	ASix_13B2
	ASix_13B3
	ASix_13B4
	ASix_14A1
	ASix_14A2
	ASix_14A3
	ASix_14A4
	ASix_14B1
	ASix_14B2
	ASix_14B3
	ASix_14B4
	ASix_15A1
	ASix_15A2
	ASix_15A3
	ASix_15A4
	ASix_15B1
	ASix_15B2
	ASix_15B3
	ASix_15B4

Corresponding programming is needed in Pluto. See “Transmit other data from the Pluto” or Manual Pluto Gateway chapter “Additional data”.

This block will receive data from Pluto AS-i local non safe AS-i slave address 12 – 15.

Input	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for inputs from the hardware configuration in GX configurator DP. Array of 32 bool.
Output	
<b>ASix_12A1 – ASix_15A4</b>	Pluto AS-i local non safe AS-i standard and extended A slave (Boolean). x= Pluto node nr.
<b>ASix_12B1 – ASix_15B4</b>	Pluto AS-i local non safe AS-i extended B slave (Boolean). x= Pluto node nr.
<b>ENO:</b>	Enable output from FB (Boolean).



#### 4.2.3.15 Function block – Additional data – ASi 16-19 non safe (read)

Instance	
Fb_ASi_16_19_NonSafe_In	
EN	ENO
Start_Address	ASix_16A1
	ASix_16A2
	ASix_16A3
	ASix_16A4
	ASix_16B1
	ASix_16B2
	ASix_16B3
	ASix_16B4
	ASix_17A1
	ASix_17A2
	ASix_17A3
	ASix_17A4
	ASix_17B1
	ASix_17B2
	ASix_17B3
	ASix_17B4
	ASix_18A1
	ASix_18A2
	ASix_18A3
	ASix_18A4
	ASix_18B1
	ASix_18B2
	ASix_18B3
	ASix_18B4
	ASix_19A1
	ASix_19A2
	ASix_19A3
	ASix_19A4
	ASix_19B1
	ASix_19B2
	ASix_19B3
	ASix_19B4

Corresponding programming is needed in Pluto. See “Transmit other data from the Pluto” or Manual Pluto Gateway chapter “Additional data”.

This block will receive data from Pluto AS-i local non safe AS-i slave address 16 – 19.

Input	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for inputs from the hardware configuration in GX configurator DP. Array of 32 bool.
Output	
<b>ASix_16A1 – ASix_19A4</b>	Pluto AS-i local non safe AS-i standard and extended A slave (Boolean). x= Pluto node nr.
<b>ASix_16B1 – ASix_19B4</b>	Pluto AS-i local non safe AS-i extended B slave (Boolean). x= Pluto node nr.
<b>ENO:</b>	Enable output from FB (Boolean).

#### 4.2.3.16 Function block – Additional data – ASi 20-23 non safe (read)

Instance	
Fb_ASi_20_23_NonSafe_In	
EN	ENO
Start_Address	ASix_20A1
	ASix_20A2
	ASix_20A3
	ASix_20A4
	ASix_20B1
	ASix_20B2
	ASix_20B3
	ASix_20B4
	ASix_21A1
	ASix_21A2
	ASix_21A3
	ASix_21A4
	ASix_21B1
	ASix_21B2
	ASix_21B3
	ASix_21B4
	ASix_22A1
	ASix_22A2
	ASix_22A3
	ASix_22A4
	ASix_22B1
	ASix_22B2
	ASix_22B3
	ASix_22B4
	ASix_23A1
	ASix_23A2
	ASix_23A3
	ASix_23A4
	ASix_23B1
	ASix_23B2
	ASix_23B3
	ASix_23B4

Corresponding programming is needed in Pluto. See “Transmit other data from the Pluto” or Manual Pluto Gateway chapter “Additional data”.

This block will receive data from Pluto AS-i local non safe AS-i slave address 20 – 23.

Input	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for inputs from the hardware configuration in GX configurator DP. Array of 32 bool.
Output	
<b>ASix_20A1 – ASix_23A4</b>	Pluto AS-i local non safe AS-i standard and extended A slave (Boolean). x= Pluto node nr.
<b>ASix_20B1 – ASix_23B4</b>	Pluto AS-i local non safe AS-i extended B slave (Boolean). x= Pluto node nr.
<b>ENO:</b>	Enable output from FB (Boolean).

#### 4.2.3.17 Function block – Additional data – ASi 24-27 non safe (read)

Instance	
Fb_ASi_24_27_NonSafe_In	
EN	ENO
Start_Address	ASix_24A1
	ASix_24A2
	ASix_24A3
	ASix_24A4
	ASix_24B1
	ASix_24B2
	ASix_24B3
	ASix_24B4
	ASix_25A1
	ASix_25A2
	ASix_25A3
	ASix_25A4
	ASix_25B1
	ASix_25B2
	ASix_25B3
	ASix_25B4
	ASix_26A1
	ASix_26A2
	ASix_26A3
	ASix_26A4
	ASix_26B1
	ASix_26B2
	ASix_26B3
	ASix_26B4
	ASix_27A1
	ASix_27A2
	ASix_27A3
	ASix_27A4
	ASix_27B1
	ASix_27B2
	ASix_27B3
	ASix_27B4

Corresponding programming is needed in Pluto. See “Transmit other data from the Pluto” or Manual Pluto Gateway chapter “Additional data”.

This block will receive data from Pluto AS-i local non safe AS-i slave address 24 – 27.

Input	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for inputs from the hardware configuration in GX configurator DP. Array of 32 bool.
Output	
<b>ASix_24A1 – ASix_27A4</b>	Pluto AS-i local non safe AS-i standard and extended A slave (Boolean). x= Pluto node nr.
<b>ASix_24B1 – ASix_27B4</b>	Pluto AS-i local non safe AS-i extended B slave (Boolean). x= Pluto node nr.
<b>ENO:</b>	Enable output from FB (Boolean).

#### 4.2.3.18 Function block – Additional data – ASi 28-31 non safe (read)

Instance	
Fb_ASi_28_31_NonSafe_In	
EN	ENO
Start_Address	ASix_28A1
	ASix_28A2
	ASix_28A3
	ASix_28A4
	ASix_28B1
	ASix_28B2
	ASix_28B3
	ASix_28B4
	ASix_29A1
	ASix_29A2
	ASix_29A3
	ASix_29A4
	ASix_29B1
	ASix_29B2
	ASix_29B3
	ASix_29B4
	ASix_30A1
	ASix_30A2
	ASix_30A3
	ASix_30A4
	ASix_30B1
	ASix_30B2
	ASix_30B3
	ASix_30B4
	ASix_31A1
	ASix_31A2
	ASix_31A3
	ASix_31A4
	ASix_31B1
	ASix_31B2
	ASix_31B3
	ASix_31B4

Corresponding programming is needed in Pluto. See “Transmit other data from the Pluto” or Manual Pluto Gateway chapter “Additional data”.

This block will receive data from Pluto AS-i local non safe AS-i slave address 28 – 31.

Input	
<b>EN:</b>	Enables or disables the complete block.
<b>Start_Address:</b>	Start address for inputs from the hardware configuration in GX configurator DP. Array of 32 bool.
Output	
<b>ASix_28A1 – ASix_31A4</b>	Pluto AS-i local non safe AS-i standard and extended A slave (Boolean). x= Pluto node nr.
<b>ASix_28B1 – ASix_31B4</b>	Pluto AS-i local non safe AS-i extended B slave (Boolean). x= Pluto node nr.
<b>ENO:</b>	Enable output from FB (Boolean).