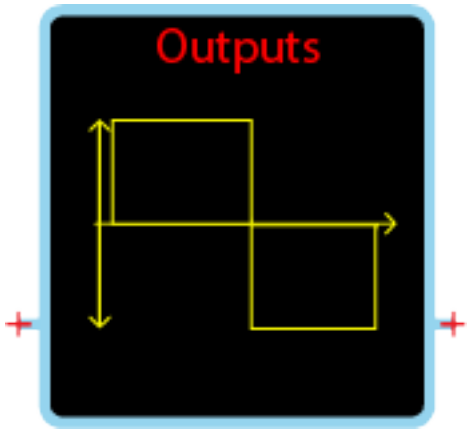
ENGINEERING
TOMORROW

User Manual

PLUS+1® GUIDE Software

PLUS+1 Function Block Library—Output Function Blocks



Revision history

Table of revisions

Date	Changed	Rev
February 2019	Rebranding	0101
May 2016	Updates for new library version.	CA
April 2014	Supports Rev 3.00	BB

Contents

Risk Reduction

Design, test, and secure applications that you develop to reduce risks of personal injury and equipment damage.

Design, Test, and Secure to Reduce Risks

Applications created with PLUS+1® GUIDE typically control equipment such as tractors, cranes, and harvesters.

Using heavy, powerful, and mobile off-road equipment always involves the risk of personal injury and equipment damage, even when this equipment is operating under normal operating conditions. Abnormal operating conditions greatly increase the risk of personal injury and equipment damage.

The PLUS+1® program has no automatic protections against these risks. The tool has no protection against the risks that result from bugs in the tool software, errors in the tool manual, or incompatibilities between software versions of the tool.

You must:

- Design your application to reduce these risks.
- Test your application to reduce these risks.
- Secure your application against unauthorized changes in its operating parameters to reduce these risks.

Design

As you design your application, you must include the fault checking and the error handling needed to reduce risks in normal and abnormal operating conditions.

Consider the following when developing fault checking and error handling for your PLUS+1® GUIDE application:

- How the machine is normally used.
- Possible operator errors and their consequences.
- Industry safety standards and legal requirements.
- Input and output failures and their consequences. These failures can include:
  - Joystick, sensor, and other inputs suddenly going to ±100 % or to 0 %.
  - Joystick, sensor, and other inputs suddenly going to ±100 % or to 0 %.
  - Outputs that control machinery direction, speed, and force suddenly changing direction or going to ±100 % or to 0 %.

    Decide how likely each failure is. The more likely a failure, the more you need to protect against the consequences of the failure.
- The sequence of events and consequences of a fault or error.
- The sequence of events and consequences of an emergency stop.

Test

After creating an application, you are responsible for testing the application.

Download your application to hardware and test its operation under both normal and abnormal operating conditions. Make sure:

- Individual inputs produce expected outputs.
- Fault handling and error checking work as designed.

You must repeat your tests when you make configuration, calibration, or software changes to the application.

Risk Reduction

Secure

You have the responsibility to secure your application against unauthorized changes.

Always use the PLUS+1® GUIDE program's Toolkey feature to restrict access to your application's operating parameters.

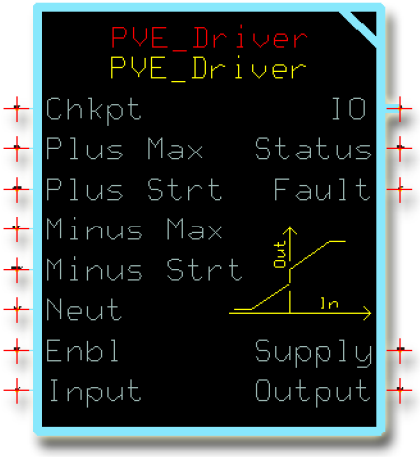
- Without Toolkey protection, there is an increased risk that unauthorized personnel could use the PLUS+1® Service Tool program to change your application's operating parameters.

  Changes in your application's operating parameters might cause unexpected machinery movement that results in personal injury and equipment damage.
- Toolkey protection reduces the risk that unauthorized personnel could use the PLUS+1® program to change your application's operating parameters.

Refer to *How to Use the Toolkey to Restrict Service Tool Access to Application Values* in the *PLUS+1—How-to* chapter of the *PLUS+1 GUIDE User Manual* (Danfoss part 10100824).

PVE_Driver Function Block

Use the **PVE_Driver** function block to control a PVE (Proportional Valve Electric) valve through a PWM (pulse-width modulation) output.



You can use this function block's **Enbl** input and **Supply** output to implement power management in your application. For more information, see the **Technical Information** document supplied with your PVE product.

Inputs

The inputs to the **PVE_Driver** function block are described.

Use only the data types specified in this table. Other data types cause compiler errors.

Item	Type	Range	Description
ChkPt	BOOL	——	• True—include the function block's built-in **Advanced Checkpoint with Namespace** in the compiled LHX download file. • False—exclude the function block's built-in **Advanced Checkpoint with Namespace** components from the compiled LHX download file.
Plus Max	U16	0–10000	The **Output** value produced by a positive **Input** value of 10000. Duty value for the maximum plus valve output. 1000 = 10.00%
Plus Strt	U16	0–10000	The **Output** value produced by a positive **Input** value of 1. Duty value for the threshold plus valve output. 1000 = 10.00%
Minus Max	U16	0–10000	The **Output** value produced by a negative **Input** value of -10000. Duty value for the maximum minus valve output. 1000 = 10.00%
Minus Strt	U16	0–10000	The **Output** value produced by a negative **Input** value of -1. Duty value for the threshold minus valve output. 1000 = 10.00%
Neut	U16	0–10000	The Output value when either the: • Input value equals 0. • Enable input goes false. Duty value for a neutral valve output. 1000 = 10.00%

PVE_Driver Function Block

Item	Type	Range	Description
Enbl	BOOL	——	Enables valve functionality. If true: • The **Output** value follows changes in the **Input** value. • The **Supply** output goes true if the **Input** value is not 0. If false: • The **Output** value equals the **Neut** value. • The **Supply** output goes false.
Input	S16	-10000–10000	Input command. 1000 = 10.00%

Outputs

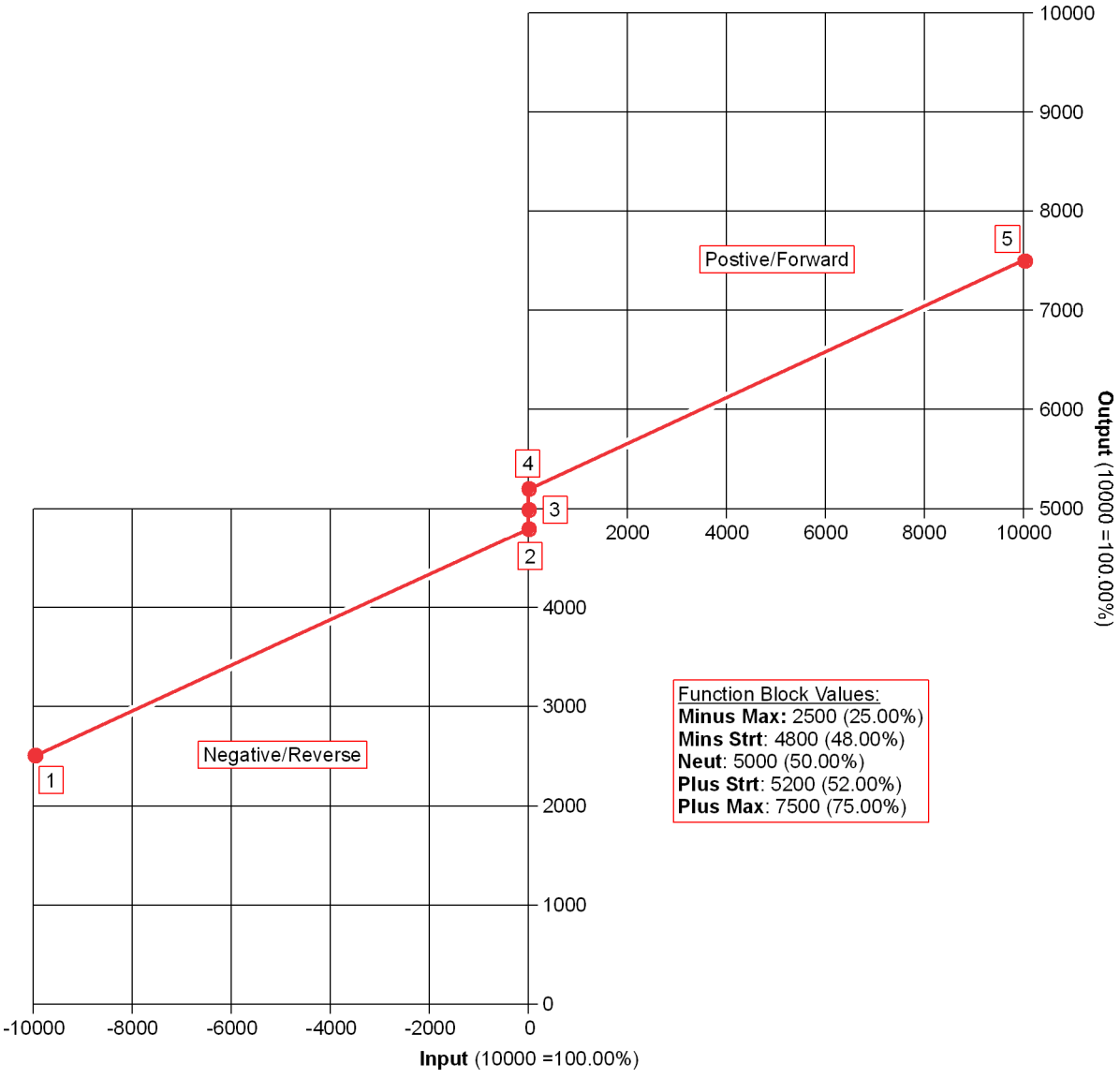
The outputs of the **PVE_Driver** function block are described.

Item	Type	Range	Description
IO	Bus	——	Outputs a bus with all of the function block's input and output signals. This bus provides a convenient way to distribute this function block's signals to your application.
Status	U16	——	Reports the status of the function block. This output follows the standard bitwise scheme described in the *Status Logic* topic.
Fault	U16	——	Reports the faults of the function block. This output follows the standard bitwise scheme described in the *Status Logic* topic.
Supply	BOOL	——	Used to enable/disable the power supply to a PVE. If multiple PVEs are powered with a single digital output, the "or" of the **Supply** signals from each function block can be used to enable the PVE power supply. True when both: • Enable input is true. • Input value is not 0. False if either: • Enable input is false. • Input value is 0.
Output	U16	0–10000	Output command. PWM duty command for controlling a PVE. 1000 = 10.00%

PVE_Driver Function Block

Function Block Example

Use the following example to understand how configuration and operation changes impact the output of the function block.

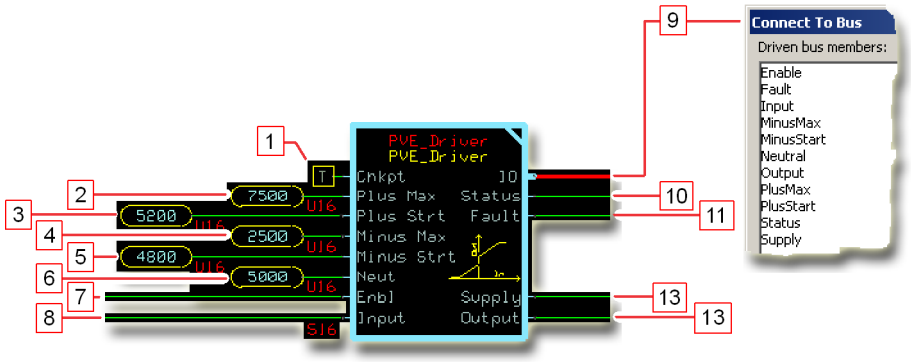


Item	Description
1	With a **Minus Max** value of 2500 (25.00%), a negative **Input** value of -10000 (-100.00%) produces an **Output** value of 2500 (25.00%).
2	With a **Minus Strt** value of 4800 (48.00%), a negative **Input** value of -1 (-0.01%) produces an **Output** value of 4800 (48.00%).
3	With a **Neut** value of 5000 (50.00%), an **Input** value of 0 (0%) produces an **Output** value of 5000 (50.00%).
4	With a **Plus Strt** value of 5200 (52.00%), a positive **Input** value of 1 (0.01%) produces an **Output** value of 5200 (52.00%).
5	With a **Plus Max** value of 7500 (75.00%), a positive **Input** value of 10000 (100.00%) produces an **Output** value of 7500 (75.00%).

PVE_Driver Function Block

Function Block Connections

Connections you can make with the **PVE_Driver** function block are described.



Item	Description
1	• True—include the function block's built-in **Advanced Checkpoint with Namespace** in the compiled LHX download file. • False—exclude the function block's built-in **Advanced Checkpoint with Namespace** components from the compiled LHX download file.
2	The maximum positive direction **Output** value produced by a positive **Input** value of 10000.
3	The threshold positive direction **Output** value produced by a positive **Input** value of 1.
4	The maximum negative direction **Output** value produced by a negative **Input** value of -10000.
5	The threshold negative direction **Output** value produced by a negative **Input** value of -1.
6	The **Output** value when either the: • **Input** value equals 0. • **Enable** input goes false.
7	If true, then: • The **Output** value follows changes in the **Input** value. • The **Supply** output goes true if the **Input** value is not 0.
8	Input command.
9	Outputs a bus with all of the function block's input and output signals.
10	Reports the status of the function block.
11	Reports the faults of the function block.
12	If true, then: • **Enable** input is true. • **Input** value is not 0.
13	Output command.

Status Logic

This topic describes how status logic is indicated for the function block.

Condition	Hex*	Binary	Cause	Response	Correction
Invalid setup.	0x8008	1000	The values of **Minus Max**, **Minus Strt**, **Neut**, **Plus Strt**, and **Plus Max** do not successively increase.	**Output** = **Neut** value. **Supply** = false.	Ensure that the **Minus Max**, **Min Strt**, **Neut**, **Plus Strt**, and **Plus Max** values successively increase.
			Minus Max, **Minus Strt**, **Neut**, **Plus Strt**, or **Plus Max** are out of range.		Return the **Minus Max**, **Minus Strt**, **Neut**, **Plus Strt**, and **Plus Max** values to within their valid ranges.

* Bit 16 set to 1 identifies a standard Danfoss status or fault code.

PVE_Driver Function Block

Fault Logic

This topic describes how fault logic is indicated for the function block.

Condition	Hex*	Binary	Cause	Response	Correction
Input value is too low.	0x8001	0001	**Input** value < -10000.	**Output** = **Neut** value. **Supply** = false.	Return the **Input** to the valid range.
Input value is too high.	0x8002	0010	**Input** value > 10000.		

* Bit 16 set to 1 identifies a standard Danfoss status or fault code.

Identical Function Blocks Need Different Namespace Values to Successfully Compile

If you use the same function block more than once in an application, you must change each function block's namespace value to avoid compiler errors.

All function blocks contain Advanced Checkpoint with Namespace components that enable the PLUS+1® Service Tool to read block input and output values.

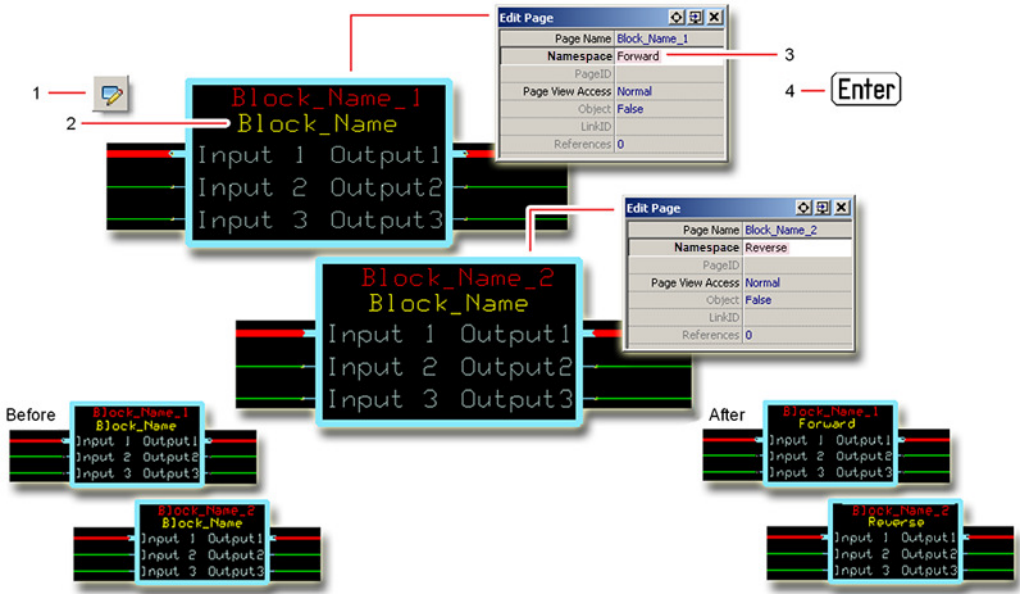
Some function blocks contain non-volatile memory components that store function block operating parameters.

Both these components use memory names ("aliases") to allocate memory. Identical memory names cause compiler errors.

The namespace value adds a unique prefix to each component name to avoid errors. Keep each namespace value short to save controller memory.

Change Namespace Value

To successfully compile your application, change the namespace value for function blocks that are used more than once in an application.



PVE_Driver Function Block

1. In the PLUS+1® GUIDE menu bar, click the **Query/Change** button.
2. Click on the function block whose namespace you want to set to a unique value.
   The **Edit Page** window opens.
3. In the **Edit Page** window, enter a meaningful **Namespace** value.
   - **Namespace** values are case-sensitive.
   - To save controller memory, use a short namespace value.
4. Press **Enter**.
5. Repeat these steps to enter unique namespace values for other identical function blocks.

PVE_Driver Function Block

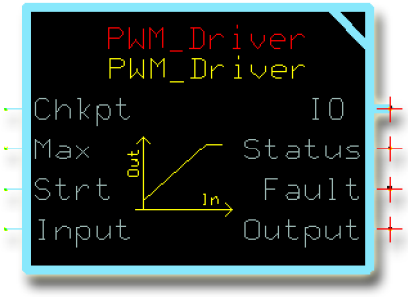
IEC 61508-3 Annex D Supplemental Information

The following table provides IEC 61508-3 Annex D supplemental information.

Item	Description
Function block name	PVE_Driver.
Function block version	4.0.
Function block development environment	PLUS+1® GUIDE version 8.1 and later.
Compatible hardware	Verified in the PLUS+1® GUIDE compile process. When the PLUS+1® GUIDE compiler finds a function block that is incompatible with hardware, it aborts the compile process and logs an error message. The error message gives the location of the function block and states "Error 80: component not supported in hwd."
Function block developed in compliance with	Danfoss Software Product Development Process (PDP), which includes ISO 9001 and IEC 61508-3 standards.
Competence required of function block integrator	The knowledge, competence, and training required to: • Understand this manual. • Use the PLUS+1® GUIDE program to develop a machine control application. • Follow quality software practices to develop a machine control application.
Contacting Danfoss	*https://www.danfoss.com/en/products/software/dps/plus1-software-services-support-and-training/plus1-support-and-services*

PWM_Driver Function Block

Use the **PWM_Driver** function block to control an electronic displacement coil (EDC) or other similar control devices that use pulse-width modulation (PWM) signals to control their displacement.



Depending on how you configure the output of your controller, you can use this generic function block to:

- Control an EDC controlled through current.
- Control an EDC controlled through duty cycles.

Inputs

The inputs to the **PWN_Driver** function block are described.

Use only the data types specified in this table. Other data types cause compiler errors.

Item	Type	Range	Description
ChkPt	BOOL	——	• True—include the function block's built-in **Advanced Checkpoint with Namespace** in the compiled LHX download file. • False—exclude the function block's built-in **Advanced Checkpoint with Namespace** components from the compiled LHX download file.
Max	U16	0–30000	The maximum **Output** value produced by an **Input** value of 10000. Coil parameter for the maximum output. This is the end current in a closed-loop control system. 1000 = 100.0 mA (for a controller configured to control an output through current). 10000 = 100.00% (for a controller configured to control an output through duty-cycles).
Strt	U16	0–30000	The minimum **Output** value produced by an **Input** value of 1. Coil parameter for the minimum output. This is the threshold current in a closed-loop control system. 1000 = 100.0 mA (for a controller configured to control an output through current). 10000 = 100.00% (for a controller configured to control an output through duty-cycles).
Input	U16	0–10000	Input command. 1000 = 10.00%

Outputs

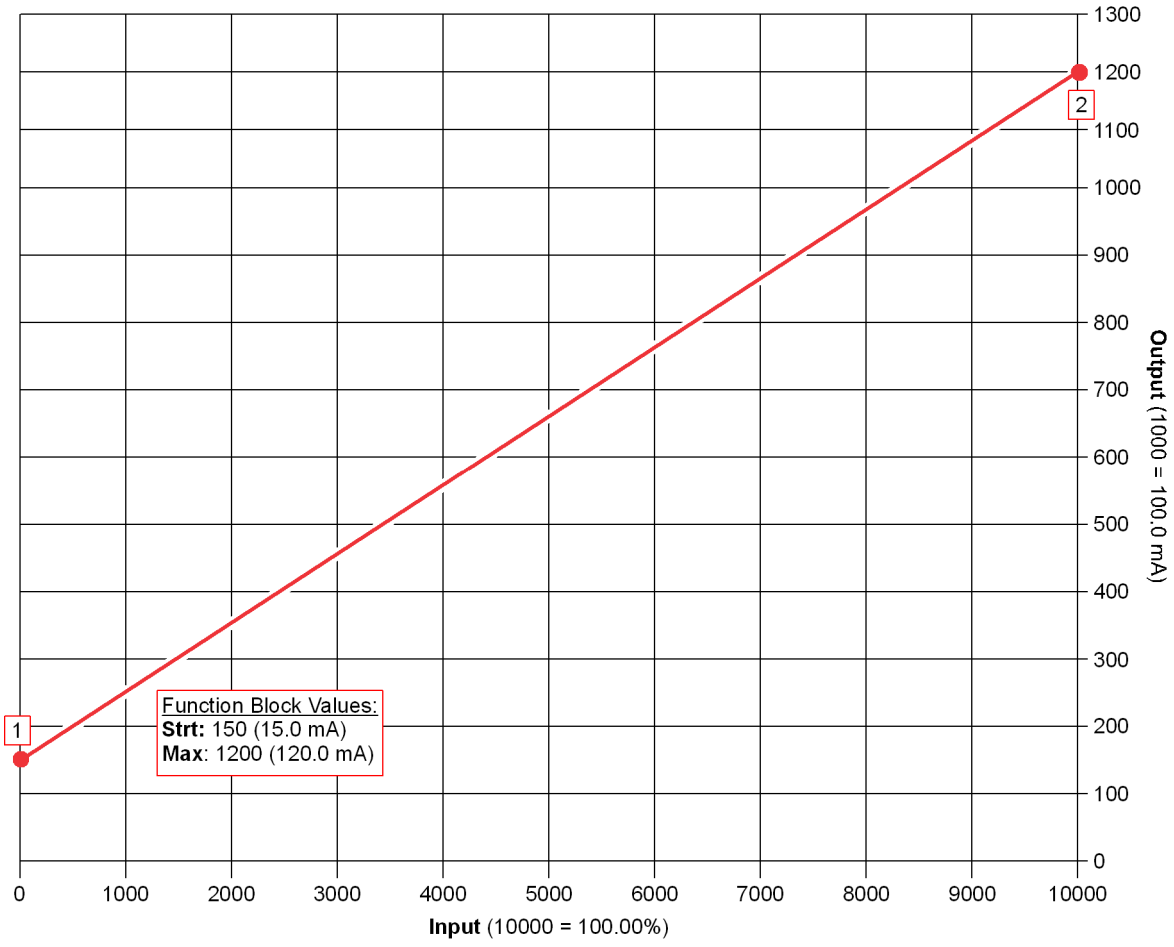
The outputs of the **PWM_Driver** function block are described.

Item	Type	Range	Description
IO	Bus	——	Outputs a bus with all of the function block's input and output signals. This bus provides a convenient way to distribute this function block's signals to your application.
Status	U16	——	Reports the status of the function block. This output follows the standard bitwise scheme described in the *Status Logic* topic.
Fault	U16	——	Reports the faults of the function block. This output follows the standard bitwise scheme described in the *Status Logic* topic.
Output	U16	0–30000	PWM duty or current command used to drive the control. • 1000 = 10.00% (for PWM duty configured controller outputs) • 1000 = 100 mA (for current configured controller outputs)

PWM_Driver Function Block

Function Block Example

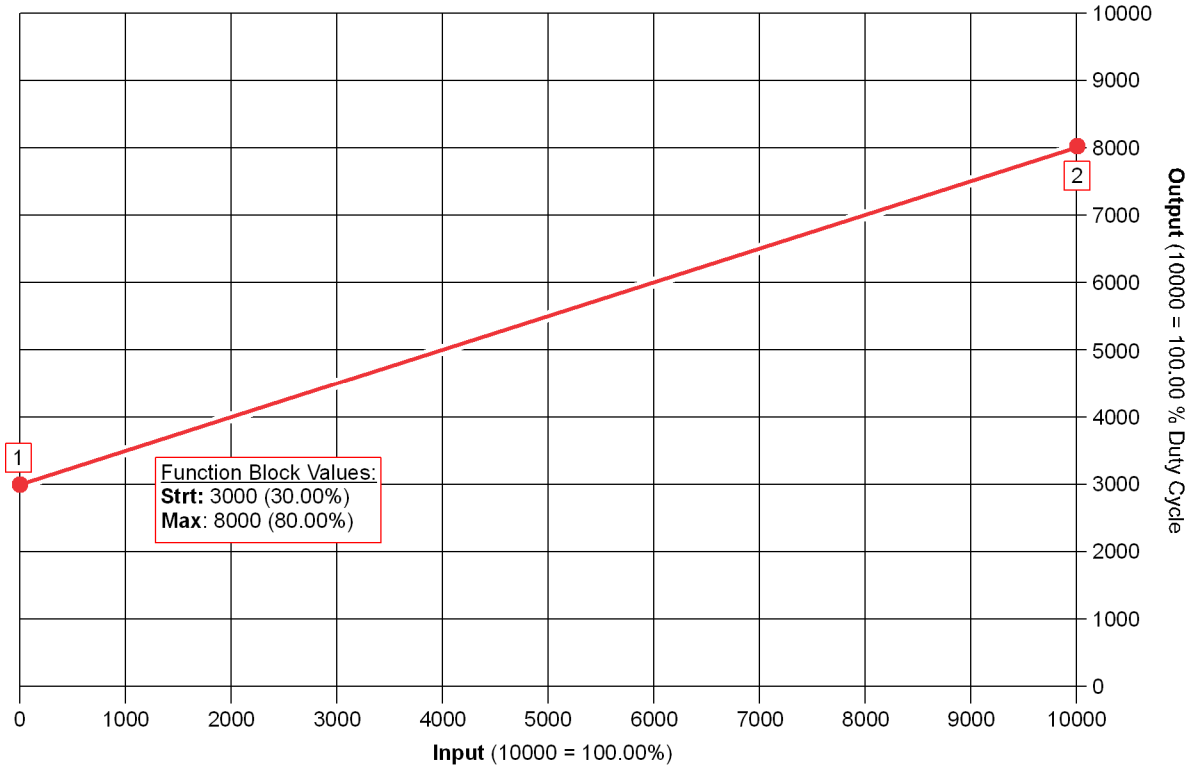
Use the following example to understand how configuration and operation changes impact the output of the function block.



The figure shows the **Output** of a **PWM_Driver** function block driving an EDC controlled through current.

Item	Description
1	With a **Strt** value of 150 (15.0 mA), an **Input** value of 1 (0.01%) produces an **Output** value of 150 (15.0 mA).
2	With a **Max** value of 1200 (120.0 mA), an **Input** value of 10000 (100.00%) produces an **Output** value of 1200 (120.0 mA).

PWM_Driver Function Block



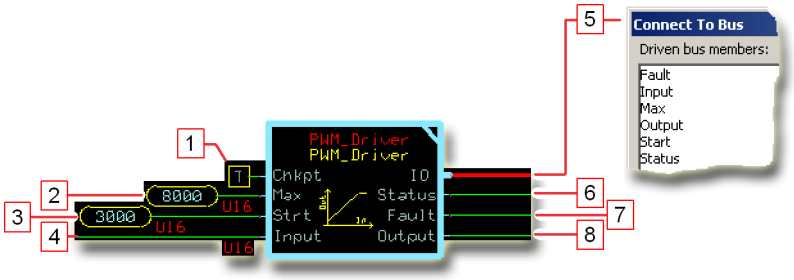
The figure shows the **Output** of a **PWM_Driver** function block driving an EDC controlled through duty cycles.

Item	Description
1	With a **Strt** value of 3000 (30.00%), an **Input** value of 1 (0.01%) produces an **Output** value of 3000 (30.00%).
2	With a **Max** value of 1200 (120.0 mA), an **Input** value of 10000 (100.00%) produces an **Output** value of 1200 (120.0 mA).

PWM_Driver Function Block

Function Block Connections

Connections you can make with the function block are described.



Item	Description
1	• True—include the function block's built-in **Advanced Checkpoint with Namespace** in the compiled LHX download file. • False—exclude the function block's built-in **Advanced Checkpoint with Namespace** components from the compiled LHX download file.
2	The maximum **Output** value produced by an **Input** value of 10000.
3	The minimum **Output** value produced by an **Input** value of 1.
4	Input command.
5	Outputs a bus with all of the function block's input and output signals.
6	Reports the status of the function block.
7	Reports the faults of the function block.
8	Output command.

Status Logic

This topic describes how status logic is indicated for the function block.

Condition	Hex*	Binary	Cause	Response	Correction
Invalid setup.	0x8008	1000	**Strt** ≥ **Max**	**Output** = 0	Ensure that **Max** > **Strt**.
			Strt or **Max** value is out of range.		Return **Strt** and **Max** values to their allowed range.

* Bit 16 set to 1 identifies a standard Danfoss status or fault code.

Fault Logic

This topic describes how fault logic is indicated for the function block.

Condition	Hex*	Binary	Cause	Response	Correction
Input value is too low.	0x8001	0001	**Input** value < 0.	**Output** = 0	Return the **Input** to the valid range.
Input value is too high.	0x8002	0010	**Input** value > 10000.		

* Bit 16 set to 1 identifies a standard Danfoss status or fault code.

Identical Function Blocks Need Different Namespace Values to Successfully Compile

If you use the same function block more than once in an application, you must change each function block's namespace value to avoid compiler errors.

All function blocks contain Advanced Checkpoint with Namespace components that enable the PLUS+1® Service Tool to read block input and output values.

Some function blocks contain non-volatile memory components that store function block operating parameters.

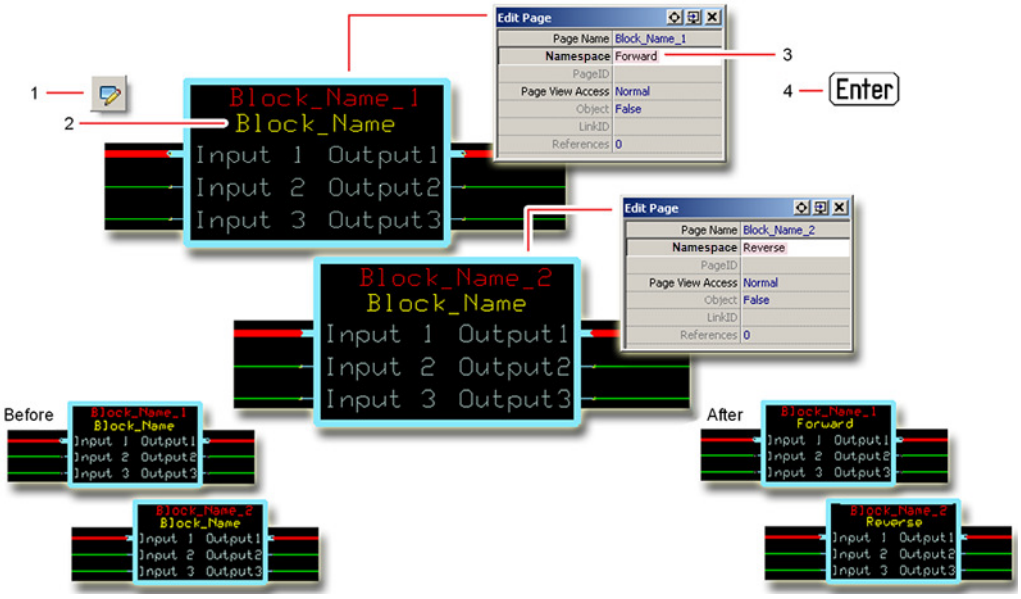
PWM_Driver Function Block

Both these components use memory names (“aliases”) to allocate memory. Identical memory names cause compiler errors.

The namespace value adds a unique prefix to each component name to avoid errors. Keep each namespace value short to save controller memory.

Change Namespace Value

To successfully compile your application, change the namespace value for function blocks that are used more than once in an application.



1. In the PLUS+1® GUIDE menu bar, click the **Query/Change** button.
2. Click on the function block whose namespace you want to set to a unique value.
   The **Edit Page** window opens.
3. In the **Edit Page** window, enter a meaningful **Namespace** value.
   - **Namespace** values are case-sensitive.
   - To save controller memory, use a short namespace value.
4. Press **Enter**.
5. Repeat these steps to enter unique namespace values for other identical function blocks.

PWM_Driver Function Block

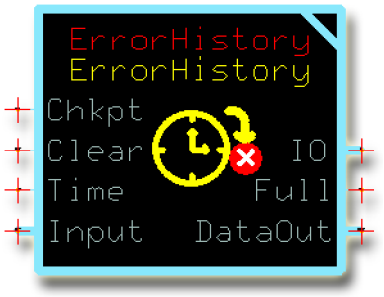
IEC 61508-3 Annex D Supplemental Information

The following table provides IEC 61508-3 Annex D supplemental information.

Item	Description
Function block name	PWM_Driver.
Function block version	4.0.
Function block development environment	PLUS+1® GUIDE version 8.1 and later.
Compatible hardware	Verified in the PLUS+1® GUIDE compile process. When the PLUS+1® GUIDE compiler finds a function block that is incompatible with hardware, it aborts the compile process and logs an error message. The error message gives the location of the function block and states "Error 80: component not supported in hwd."
Function block developed in compliance with	Danfoss Software Product Development Process (PDP), which includes ISO 9001 and IEC 61508-3 standards.
Competence required of function block integrator	The knowledge, competence, and training required to: • Understand this manual. • Use the PLUS+1® GUIDE program to develop a machine control application. • Follow quality software practices to develop a machine control application.
Contacting Danfoss	*https://www.danfoss.com/en/products/software/dps/plus1-software-services-support-and-training/plus1-support-and-services*

ErrorHistory Function Block

Use the ErrorHistory function block to record application errors.



This function block can maintain up to ten separate error records for an application. Each error record has a:

- Code that indicates the location of the error.
- Code that indicates the type of the error. (Create separate error records to record different types of errors at the same location.)
- Count of the number of times that the error occurred.
- Time stamps that mark the time of the first error and the time of the most recent error.

Two **ErrorHistory** function blocks can be bussed together to record up to twenty separate application errors.

The **ErrorHistory** function block has no **Status** or **Fault** outputs.

Inputs

The inputs to the **ErrorHistory** function block are described.

Use only the data types specified in this table. Other data types cause compiler errors.

Item	Type	Range	Description
ChkPt	BOOL	——	• True—include the function block's built-in **Advanced Checkpoint with Namespace** in the compiled LHX download file. • False—exclude the function block's built-in **Advanced Checkpoint with Namespace** components from the compiled LHX download file.
Clear	BOOL	——	A positive transition clears all error records from the function block's memory. Sets all the function block's **Location**, **Type**, **OC** (Occurrence Count), **First** occurrence, and **Last** occurrence values to 0.
Time	U32	0–4,294,967,296	Current time to be recorded when a fault is stored. Used to record the first occurrence of an error and at the most recent occurrence of the error. Time units are user-defined.
Input	Bus	——	Contains **LocList**, **TypeList**, and **Assigned** signals.
LocList	Array[*n*]U8	$n \leq 20$	Array of the location codes for active errors. The error history saves an identifier associated with the error's source location. The location at a given index on this list corresponds to the error type at the same index of the **TypeList**. $n \leq 20$
TypeList	Array[*n*]U8	$n \leq 20$	Array of the type codes for active errors. The error history saves an identifier associated with the error's type. The location at a given index on this list corresponds to the error location at the same index of the **LocList**. $n \leq 20$
Assigned	Array[*n*]BOOL	$n \leq 20$	An array where each index indicates whether the corresponding index in the **LocList** and **TypeList** has been stored. • T—the corresponding index in the **LocList** and **TypeList** has been stored. • F—the corresponding index in the **LocList** and **TypeList** has not been stored.

ErrorHistory Function Block

Outputs

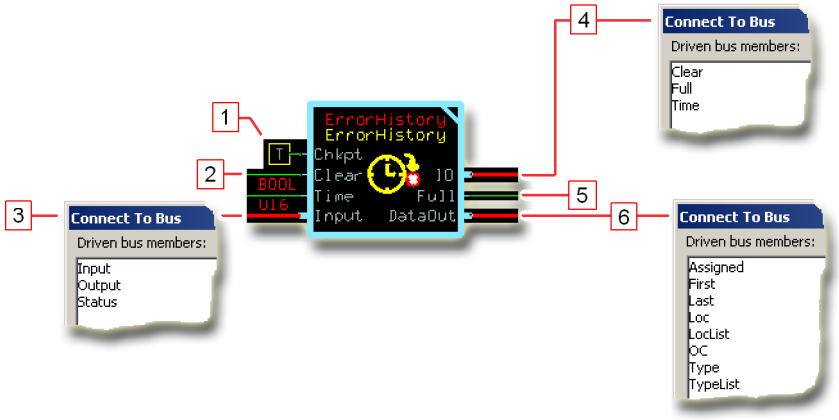
The outputs of the **ErrorHistory** function block are described.

Item	Type	Range	Description
IO	Bus	——	Outputs a bus with all of the function block's input and output signals. This bus provides a convenient way to distribute this function block's signals to your application.
Full	BOOL	——	Indicates that all records are full. New location/type combinations are not stored in the function block's internal EEPROM. A second function block can be used to store more records. • T—the function block has no more memory locations available to store error records. • F—the function block has at least one memory location available to store an error record.
DataOut	Bus	——	Contains signals to be passed to another **ErrorHistory** function block. This allows for more location/type combinations to be stored in EEPROM. Outputs: • **LocList** signal. • **TypeList** signal. • **Assigned** signal. • Ten sub-buses labeled **EE_0**, **EE_1**, **EE_2**, **EE_3**, **EE_4**, **EE_5**, **EE_6**, **EE_7**, **EE_8**, and **EE_9**. Signals within these buses provide access to error record values.
LocList	Array[20]U8	0–255	Array of location codes for active errors. Use as an input to a second **ErrorHistory** function block.
TypeList	Array[20]U8	0–255	Array of error type codes for active errors. Use as an input to a second **ErrorHistory** function block.
Assigned	Array[20]BOOL	——	Array where each index indicates whether the corresponding index in the **LocList** and **TypeList** has been stored. Can also be used as an input to a second **ErrorHistory** function block. • T—the corresponding index in the **LocList** and **TypeList** has been stored. • F—the corresponding index in the **LocList** and **TypeList** has not been stored.
EE_x	Bus	——	Each **EE_x** bus (where **x** is a value from 0 to 9) connects to a memory location. Memory components in these memory locations store error records. The function block has ten memory locations to store ten error records. Signals in each **EE_x** sub-bus output the error information stored at these memory locations. Each **EE_x** sub-bus has five signals: • **Loc** signal. • **Type** signal. • **OC** signal. • **Last** signal. • **First** signal.
Loc	U8	0–255	Outputs the error location code stored at the memory location connected to **Bus_x**.
Type	U8	0–255	Outputs the error type code stored at the memory location connected to **Bus_x**.
OC	U8	0–255	Outputs the total occurrences for the error stored at the memory location connected to **Bus_x**.
Last	U32	0–4, 294, 967, 295	Outputs the time stamp of the last error stored at the memory location connected to **Bus_x**. Time units are user-defined.
First	U32	0–4, 294, 967, 295	Outputs the time stamp of the first error stored at error stored at a memory location connected to **Bus_x**. Time units are user-defined.

ErrorHistory Function Block

Function Block Connections

Connections you can make with the function block are described.



Item	Description
1	• True—include the function block's built-in **Advanced Checkpoint with Namespace** in the compiled LHX download file. • False—exclude the function block's built-in **Advanced Checkpoint with Namespace** components from the compiled LHX download file.
2	A positive transition clears all the function block's error records.
3	Bus input for **LocList**, **TypeList**, and **Assigned** signals.
4	Outputs a bus with all of the function block's input and output signals.
5	• T—the function block has no more memory locations available to store error records. • F—the function block has at least one memory location available to store an error record.
6	Outputs: • Ten sub-buses labeled **EE_0**, **EE_1**, **EE_2**, **EE_3**, **EE_4**, **EE_5**, **EE_6**, **EE_7**, **EE_8**, and **EE_9**. Signals within these buses provide access to error record values. • **LocList** signal. Use as an input to a second **ErrorHistory** function block. • **TypeList** signal. Use as an input to a second **ErrorHistory** function block. • **Assigned** signal. Use as an input to a second **ErrorHistory** function block.

Identical Function Blocks Need Different Namespace Values to Successfully Compile

If you use the same function block more than once in an application, you must change each function block's namespace value to avoid compiler errors.

All function blocks contain Advanced Checkpoint with Namespace components that enable the PLUS+1® Service Tool to read block input and output values.

Some function blocks contain non-volatile memory components that store function block operating parameters.

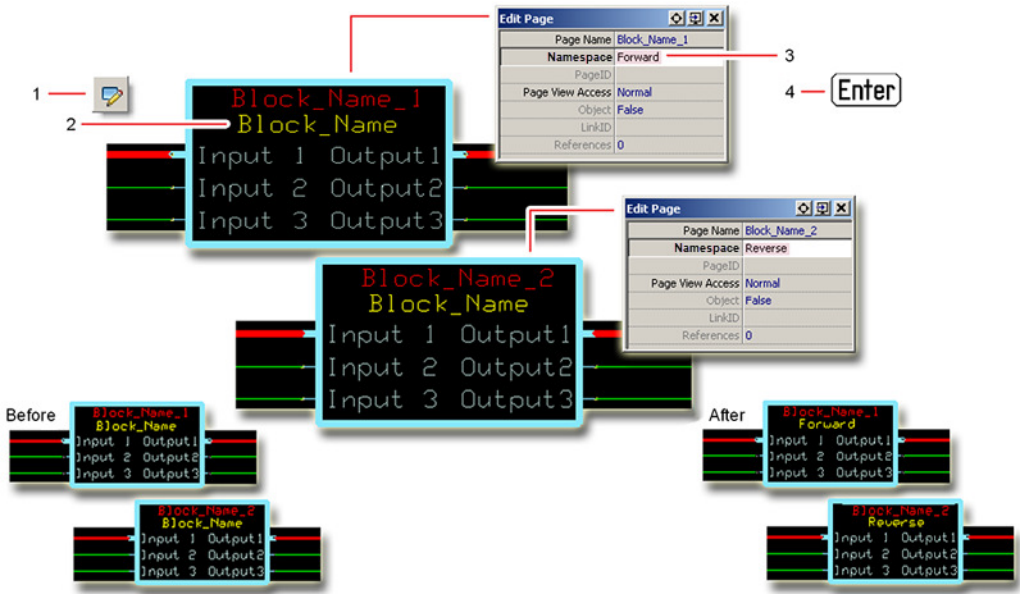
Both these components use memory names ("aliases") to allocate memory. Identical memory names cause compiler errors.

The namespace value adds a unique prefix to each component name to avoid errors. Keep each namespace value short to save controller memory.

ErrorHistory Function Block

Change Namespace Value

To successfully compile your application, change the namespace value for function blocks that are used more than once in an application.



1. In the PLUS+1® GUIDE menu bar, click the **Query/Change** button.
2. Click on the function block whose namespace you want to set to a unique value.

   The **Edit Page** window opens.
3. In the **Edit Page** window, enter a meaningful **Namespace** value.
   - **Namespace** values are case-sensitive.
   - To save controller memory, use a short namespace value.
4. Press **Enter**.
5. Repeat these steps to enter unique namespace values for other identical function blocks.

ErrorHistory Function Block

IEC 61508-3 Annex D Supplemental Information

The following table provides IEC 61508-3 Annex D supplemental information.

Item	Description
Function block name	ErrorHistory.
Function block version	4.0.
Function block development environment	PLUS+1® GUIDE version 8.1 and later.
Compatible hardware	Verified in the PLUS+1® GUIDE compile process. When the PLUS+1® GUIDE compiler finds a function block that is incompatible with hardware, it aborts the compile process and logs an error message. The error message gives the location of the function block and states "Error 80: component not supported in hwd."
Function block developed in compliance with	Danfoss Software Product Development Process (PDP), which includes ISO 9001 and IEC 61508-3 standards.
Competence required of function block integrator	The knowledge, competence, and training required to: • Understand this manual. • Use the PLUS+1® GUIDE program to develop a machine control application. • Follow quality software practices to develop a machine control application.
Contacting Danfoss	*https://www.danfoss.com/en/products/software/dps/plus1-software-services-support-and-training/plus1-support-and-services*

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