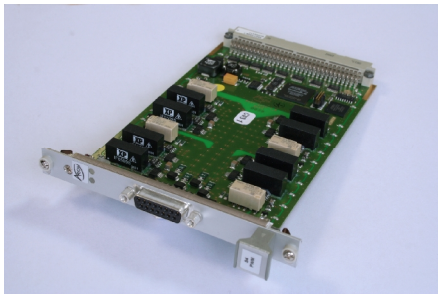
PWM Outputs (x4) optically isolated

Ref: 5057-0608-1

Arion-IO Technical specification

Features



- 4 differential outputs
- 5VDC or up to 60VDC sourcing
- Frequency Range: 10Hz to 100KHz ±1%
- Threshold voltage :

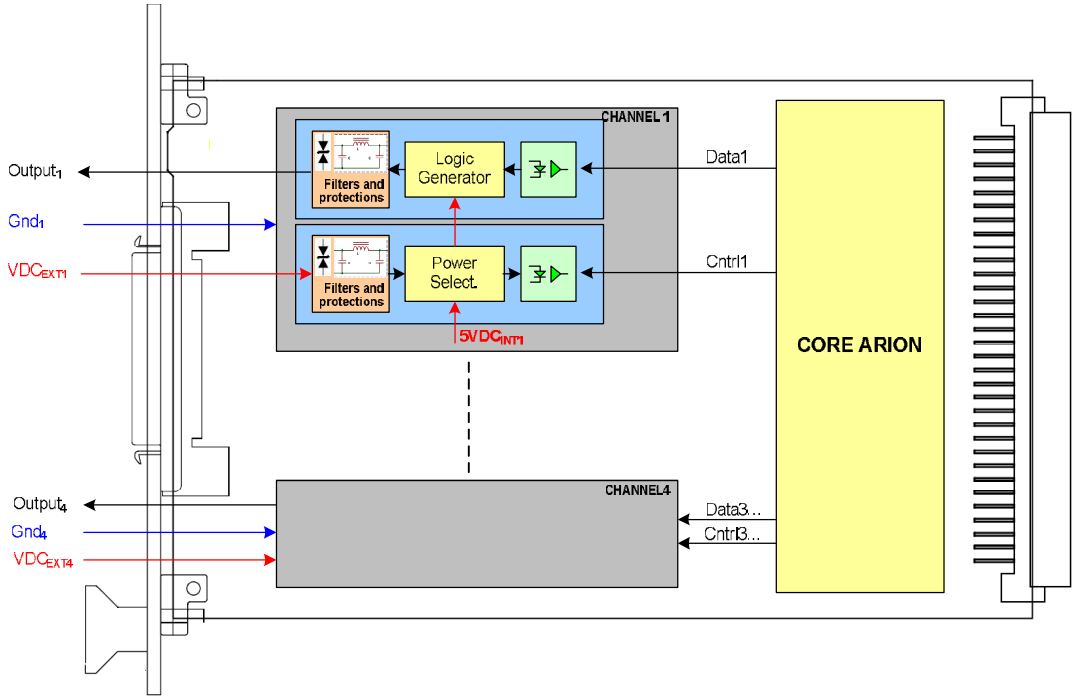
Mode	Z	Low level	High level
Current	≥ 100Ω	0V to 0.1V	2.5V to 5V
Voltage	≥ 100KΩ	0V to 0.1V	2.5V to 5V
External Voltage	≥ 100KΩ	0V to 0.1V	2.5V up to 60V

- Optically isolated: provides a direct connection to industrial equipments
- Common mode transient immunity of 100V/µs
- All outputs are protected from transient voltage spikes, short-circuits and overvoltage

Physical and environmental condition

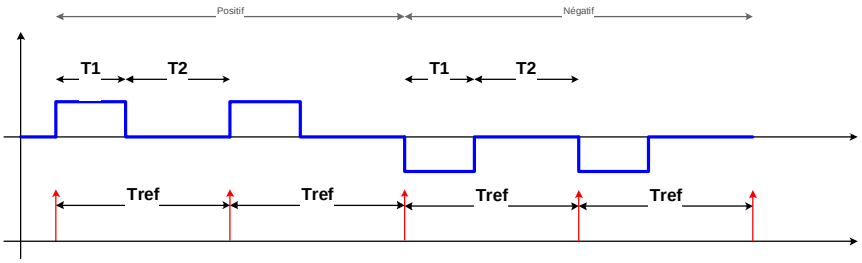
Dimensions:	3U format (length 160mm) x 3T
Temperature:	Industrial range temperature -40°C / +85°C
Weight:	300g
Consumption:	450mA for analogical 5V line and 300mA for numerical 3.3V line

Block diagram



Principle

This board generates the duty cycle of the PWM signal outputs at F_{ref} frequency. This frequency is set during the configuration mode *(see Configuration documentation for more information)*:

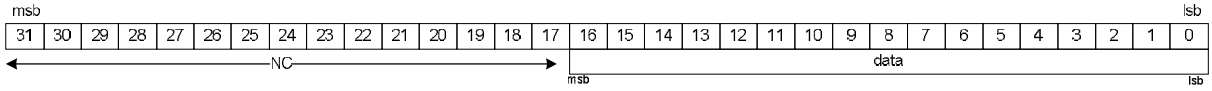


The duty cycle K is set as:

$$K = T_1 / (T_1 + T_2)$$
$$T_1 = K * T_{Ref}$$
$$0 \leq K \leq 1$$

The duty cycle K is encoded on 17 bits in binary with LSB = 1/100,000.

Data coding:



Arion operating modes

Regarding the data of Arion-IO boards, three operating modes are available.
These 3 modes can be used in 'Global Channel' or 'Channel List' ; See Configuration documentation for more information.

1. **Cyclic mode:** *default mode*

   On cyclic trigger, the data are set to the outputs of the board.

   Remark: The cyclic trigger is created by a configurable timer. This timer is set during the configuration step.

2. **Up-Sampled mode:** *this mode works like cyclic mode but with N samples.*

   On cyclic trigger, a sub-cycle is defined to set N data samples to the outputs of the board.

   Remark: The N number of samples has to be defined during the configuration step.

3. **On demand:** *this mode is only available on Output Boards.*

   The data are set to the outputs of the board when the user writes data.

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Arion-IO Board installation

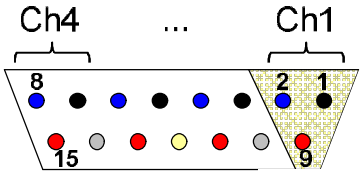
Board installation

This board can be installed in any of the 11 slots of the Arion-IO rack. Each position gives a specific address to the board: addresses 3 to 13 are valid *(See Arion-IO Module installation documentation)*
This address is used to define the configuration commands send to the boards. *(See configuration documentation)*

Board Connector - Pin assignment

Front view board's connector:

- VCC EXT
- PWM OUT
- GND EXT
- GND MECA
- NC



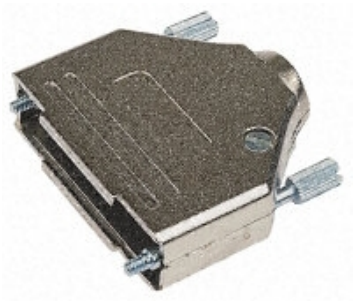
	Pin No	Signal Name
Ch1	1	GND_EXT1
	2	OUT_PWM1
	9	VCC_EXT1
	10	NC
Ch2	3	GND_EXT2
	4	OUT_PWM2
	11	VCC_EXT2
	12	*GND MECA*
Ch3	5	GND_EXT3
	6	OUT_PWM3
	13	VCC_EXT3
	14	NC
Ch4	7	GND_EXT4
	8	OUT_PWM4
	15	VCC_EXT4

Accessories

Examples of male connector and cap lock to use to make a cable:

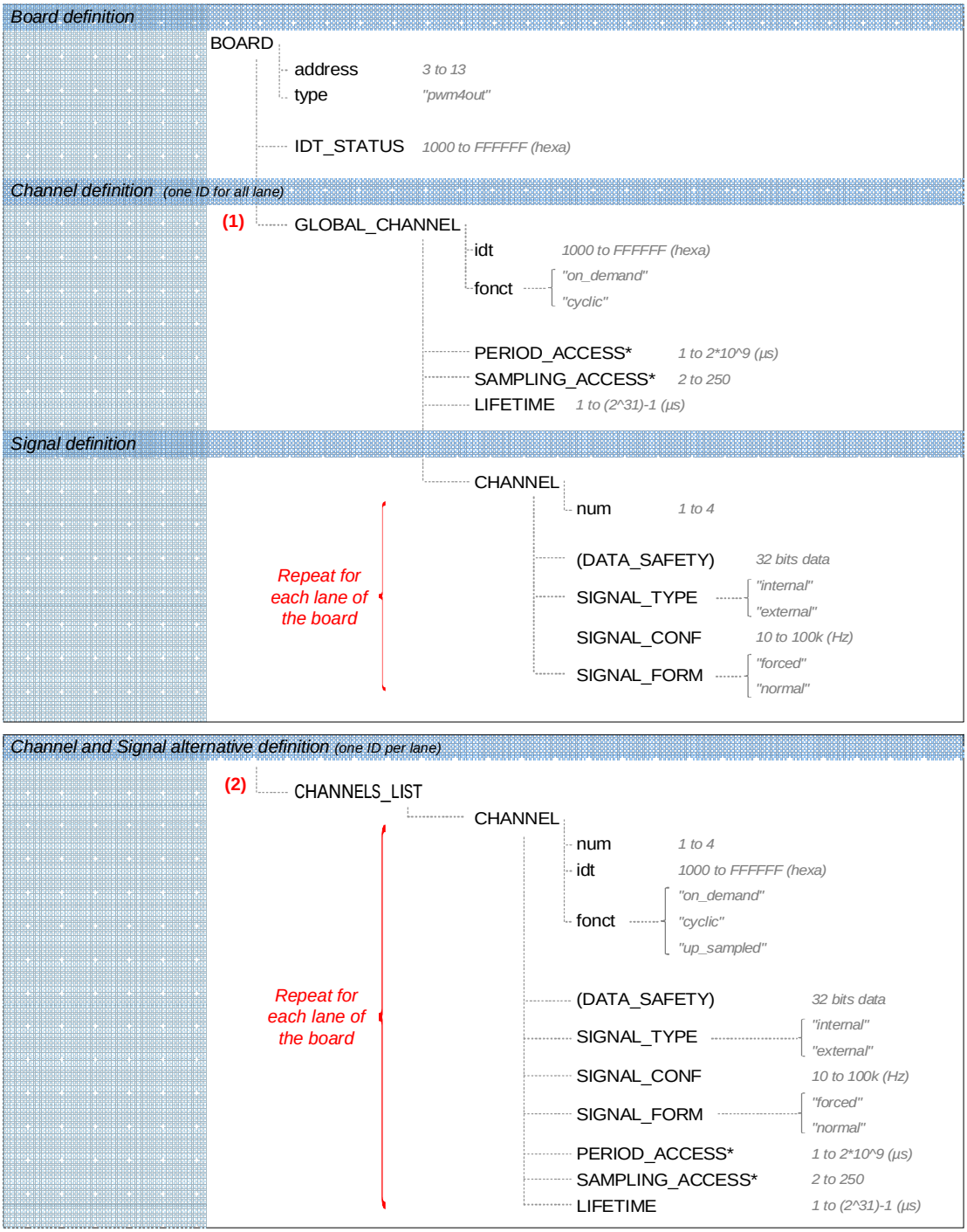
Harting products:

- § Connector : ref 09 67 015 5604
- § Metal cap lock : ref 09 67 015 0348



Configuration pattern

You must follow the tag and attribute order explain in this pattern to write your ArionIO.xml.



Uppercase = XML tag
Lowercase = XML attribute
Lowercase italic = value
(1) … (2) = Alternative configuration
( ) = Optional tag configuration
* = Conditional configuration (see table below)

Parameters description

Name	Value	Fonction	Special condition
Board definition (Tag: BOARD)			
address	integer (3 to 13)	Address of the board	*none*
type	pwm4out	Type of the board	*none*
IDT_STATUS	1000 to FFFFFF	Unique ID of the data status of the board in hexadecimal	*none*
Channel definition (Tag: GLOBAL_CHANNEL, CHANNELS_LIST)			
idt	1000 to FFFFFF	Unique ID of the data object in hexadecimal	*none*
fonct	on_demand cyclic up_sampled	Set the fonctional mode of the data object	*none*
PERIOD_ACCESS	integer (1 to 2*10^9)	LSB=1us (multiple of arion timer_x)	ONLY IF: cyclic or up-sampled mode
SAMPLING_ACCESS	integer (2 to 250)	Number of sample per period. LSB=1us (multiple of arion timer_x)	ONLY IF: up-sampled mode
LIFETIME	integer (1 to (2^31)-1)	Time validity of data object (LSB=1us)	*none*
Signal definition (Tag: CHANNEL)			
num	integer (1 to 8)	Lane number of the board	*none*
DATA_SAFETY	32 bits value	Default data value in case of dysfunction	Optional
SIGNAL_TYPE	internal external	Configuration of the lane's power source: internal or external power	*none*
SIGNAL_CONF	10 to 100,000 (Hz)	Output frequency configuration	*none*
SIGNAL_FORM	forced normal	???	*none*

Remarks:

In GLOBAL_CHANNEL configuration, only one object with unique ID is set for the 4 channels of the board. All the data are in the same object.
In CHANNEL_LIST configuration, each channel has an object with unique ID for their data.

In up-sampled mode PERIOD_ACCESS / SAMPLING_ACCESS must be:
- -an integer value
- -multiple of 2µs and greater than 10µs
- -less than 2,097,151µs (2^{21}µs)

The tag “IDT_STATUS” and the attribute “idt” can be set as “auto” in the XML. In this case the IDs are created automatically.

idt format: “rack number”+”board number”+”channel number”
IDT_STATUS format: “rack number”+”board number”+100

WARNING: The slots 3 to 13 are numbered from 1 to 11. For example, rack 2 / board in slot 7 / channel 3:
- -idt: 25003
- -IDT_STATUS: 25100