



## IDOM IO Logic Module User Guide



V1.0.0



## About this User Guide

This User Guide provides information which will allow the user to install, setup and commission the IDOM IO Logic option module for use with the ID700 drive.

For full & detailed information on the ID700 and its options, please refer to further documentation that can be found on the Imoticon Drives Ltd website: [www.imoticon.co.uk](http://www.imoticon.co.uk)

### Safety Information

Please read the Safety Information in the Easy Start Guide carefully. Please read and observe the safety information in this Easy Start Guide.

### General Information

The contents of this User Guide are believed to be correct at the time of printing. In the interests of continuous improvement, the authors reserve the right to change the contents of the IDOM IO Logic User Guide without notice.

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### ID700 Firmware

This User Guide was written with reference to the latest version of IDOM IO Logic option module and ID700 firmware. Depending on the age of the IDOM IO Logic option module and drive, some of the features described in this set up guide may not be available.

### Advance User Manual and Knowledge Base documents

The ID700 Advanced User Manual can be downloaded from [www.imoticon.co.uk](http://www.imoticon.co.uk). The Advanced User Manual contains information on the advanced parameters and advanced menu functions.

Knowledge Base documents can be downloaded from [www.imoticon.co.uk](http://www.imoticon.co.uk). The Knowledge Base documents give application notes and set up examples for the ID700.

[www.imoticon.co.uk](http://www.imoticon.co.uk)

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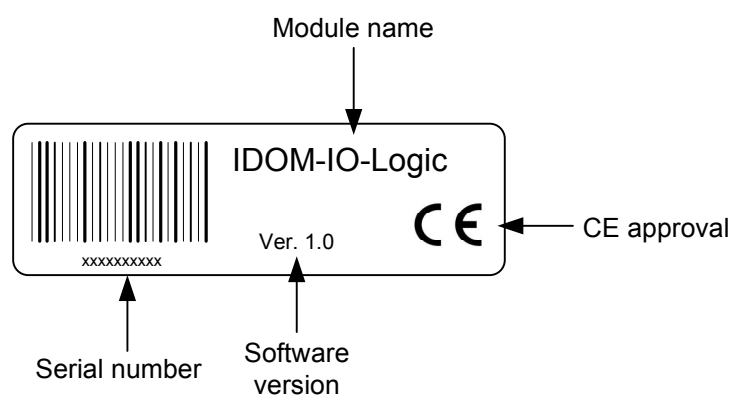
### 3. Product Introduction

The IDOM IO Logic module is an option module for the ID700 which can add extra inputs and outputs to increase the functionality of the drive.

#### IDOM IO Logic module functionality

- 3 x digital inputs
- 1 x analogue input
- 1 x digital output
- 1 x analogue output
- 1 x relay output
- +5V or +24VDC user supply
- +10VDC user supply

#### IDOM Rating label information



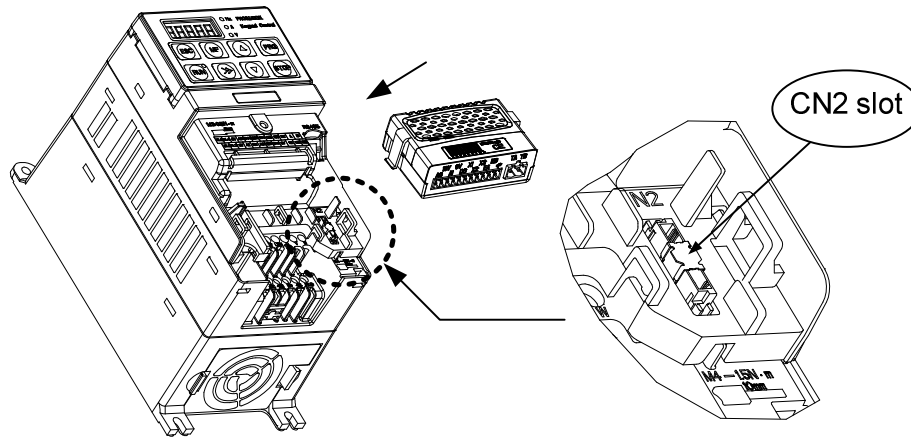
## 4. Terminal specification

Type	Terminal Name	Function	Specification
Digital Inputs	X1, X2, X3	Programmable digital input terminals	The terminal logic is negative logic (0V common) Input resistance: 10 k $\Omega$ High, low logic threshold: 10V $\pm$ 1V
Digital output	DO	Programmable digital output terminal	Output: +24V and 0V Max. output current: 50mA
Analogue Input & Output	AI	Programmable Analogue input	0V $\sim$ 10V Input resistance: 100k $\Omega$ Min. Potentiometer resistance: 2k $\Omega$ 0 (4) mA $\sim$ 20mA Load resistance:188 $\Omega$ Resolution: 0.1% Accuracy: 2%
	AO	Programmable Analogue output	0V $\sim$ 10V Max. output current: 10mA Resolution: 0.4% Accuracy: $\pm$ 5% 0 $\sim$ 20mA/20 $\sim$ 0mA/4 $\sim$ 20mA/20 $\sim$ 4mA Accuracy: 1%
Rail supply	10V	Analogue reference supply	Accuracy: 2% Maximum output current: 10mA
	+P	User supply	+5VDC or +24VDC selected by the setting of P19.31 (default is 5VDC) Accuracy: $\pm$ 15% Maximum output current: 100mA
	0V	Common	Common connection for all external devices
Relay	TA, TB	Programmable Relay output contacts	Type: Normally open Update rate: 5ms Contact rating: 250VAC/2A(cos $\phi$ =1) 250VAC/1A(cos $\phi$ =0.4) 30VDC/1A
NOT USED	EA, EB		

**NOTE:** The IDOM IO Logic option module uses the ID700 power supply which meets the ELV specification.

## 5. Mechanical installation

The IDOM option module connector is located and IDOM option module is installed as shown in the diagram below:



### IDOM Dimensions

Height (mm)	Width (mm)	Depth (mm)
70	45	23

### General Installation

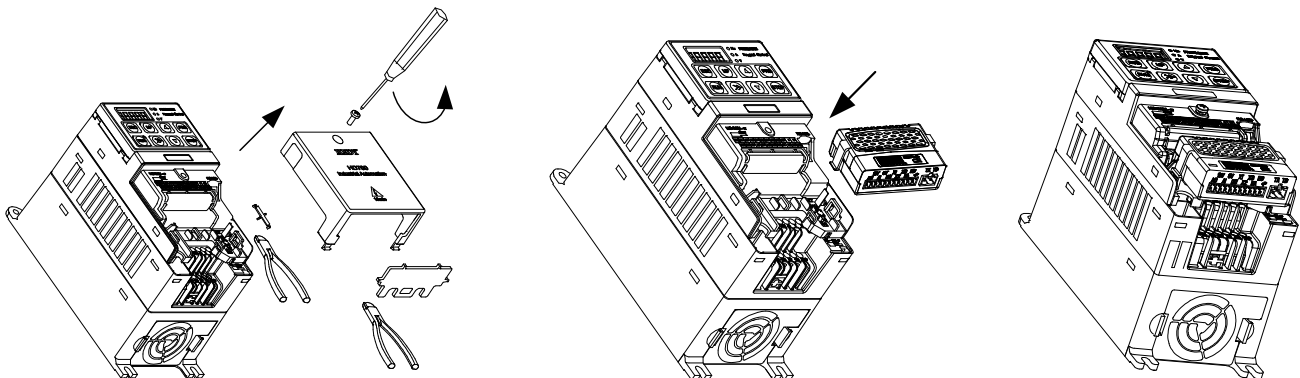
Before installing HDOM-IO-Logic in any drive, ensure the power supply has been disconnected for at least 10 minutes. **NOTE: The IDOM IO Logic module does not support hot fit and unfit.**

Check the module appearance. If there is any damage, please contact your supplier.

Remove the drive terminal cover.

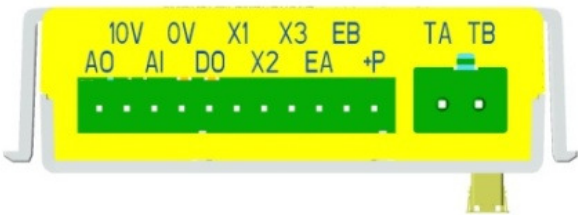
If there is a plastic protective cover on CN2 slot, please remove it carefully.

Locate the connector on the back of the IDOM module to the CN2 connector on the ID700. Push the IDOM module into the CN2 connector on the drive



### 5.2 Electrical installation

Terminal Configuration



AO	10V	AI	0V	DO	X1	X2	X3	NC	NC	+P	TA	TB
----	-----	----	----	----	----	----	----	----	----	----	----	----

Control Cable Sizing

Recommended user control cable size: 0.5mm<sup>2</sup> to 0.75mm<sup>2</sup>  
Maximum size of relay cables: 1.5mm<sup>2</sup>

Digital input terminal connections

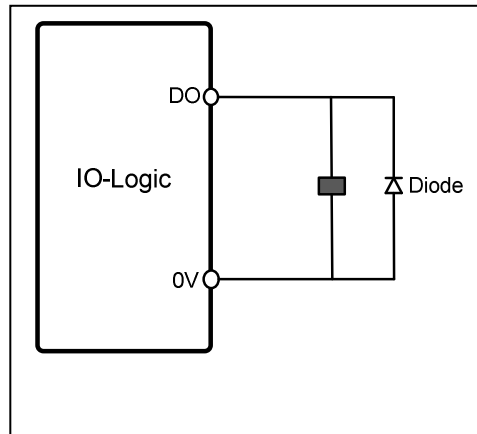
The common of the IDOM IO Logic module is 0V (Negative logic)

Switch / Relay	
Open collector - NPN	
Open collector - PNP	

### Digital Output terminal connections

The digital output terminal is Open Collector type (+24V output).

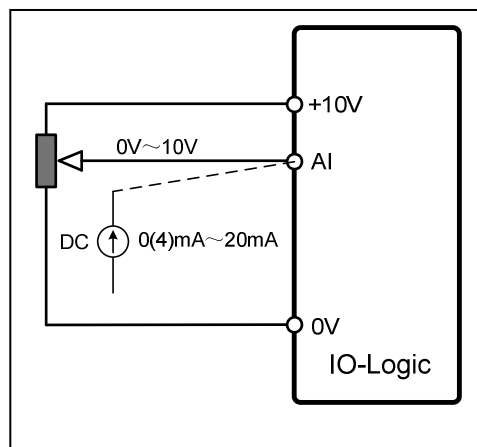
**NOTE:** When use the digital output to drive an inductive load (relay), take care the polarity of the inductive load and use a snubber devices i.e. diode. See diagram below.



### Analogue input terminal connection

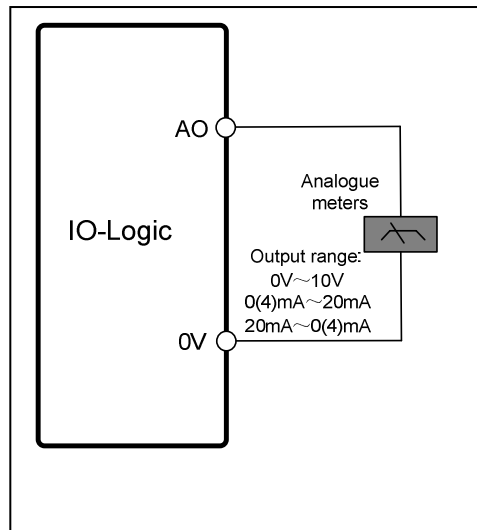
The analogue input mode can be selected by the setting of parameter P19.17. Refer to chapter 6 for the description of P19.17. See diagram below.

**NOTE:** Wiring distance should be as short as possible. If there is the possibility of the analogue input being disturbed by noise, use screened cable and install a filtering capacitor between the analogue input signal and 0V.



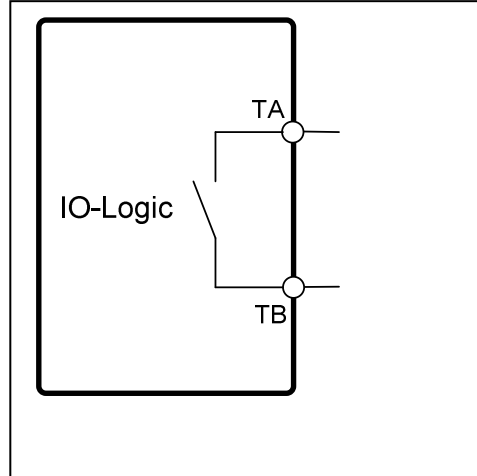
## Analogue output terminal connection

Analogue output mode can be selected by the setting of P19.38. Refer to chapter 6 for the description of P19.38. See diagram below.



## Relay output terminal connections

The relay output function can be set by the setting of parameter P19.07. Refer to chapter 6 for the description of P19.07. See diagram below.



## 6. Initial Set-Up Information

Once the IDOM IO Logic Module has been installed correctly, power on the ID700 drive.

The RED indicator LED on the IDOM IO Logic Module will light up.

When the LED flashes GREEN, this indicates that the module is operating correctly.

If the indicator LED stays red and doesn't change to green, this means that the communications link between the IDOM IO module and ID700 drive is incorrect. Power off and check the connection between module and drive.

Access menu Group 19 and the value of P19.01 should be 201.

**NOTE:** When using the IDOM IO Logic Module for first time with the ID700 drive, set P00.24 to 1 and press the PRG key to load factory default parameters. It is important that this step is followed to allow correct programming and operation of the IDOM IO Logic Module.

### Parameter Descriptions

**NOTE:** Change mode shows what condition the drive needs to be in to allow the parameter to be changed. Rated voltage of the motor (taken from the motor nameplate)

Parameter	Parameter name	Range 【Default】	Change mode
P19.01	Module ID Code	0 ~ 999 【0】	Read only

Indicates the type of module installed into the CN2 slot on the ID700

With the IDOM IO Logic Module fitted, P19.01 will display **201**.

**NOTE:** With no module fitted, P19.01 shows 0 and only P19.01 is displayed in menu 19.

Parameter	Parameter name	Range 【Default】	Change mode
P19.02	Digital input X1 function select	P01.01 ~ P18.08 【0.00】	Stop only
P19.03	Digital input X2 function select	P01.01 ~ P18.08 【0.00】	Stop only
P19.04	Digital input X3 function select	P01.01 ~ P18.08 【0.00】	Stop only

Selects the function of digital input terminals X1, X2, X3 respectively.

The set up is similar to the ID700 digital input terminals. See the ID700 Advanced User Manual for details.

Parameter	Parameter name	Range 【Default】	Change mode
P19.05	Analogue input AI function select	P01.01 ~ P18.08 【0.00】	Stop only

Selects the function of the analogue input terminal AI.

The set up is similar to the ID700 analogue input terminal. See the ID700 Advanced User Manual for details.

Parameter	Parameter name	Range 【Default】	Change mode
P19.06	Not used		

Parameter	Parameter name	Range 【Default】	Change mode
P19.07	Relay TA & TB function select	P01.01 ~ P18.08 【0.00】	Run & Stop

Selects the function of the relay terminals TA & TB.

The set up is similar to the ID700 relays. See the ID700 Advanced User Manual for details.

**NOTE:** The relay contacts are Normally Open.

Parameter	Parameter name	Range 【Default】	Change mode
P19.08	Digital output DO function select	P01.01 ~ P18.08 【0.00】	Run & Stop

Selects the function of the digital output terminal DO

The set up is similar to the ID700 digital output. See the ID700 Advanced User Manual for details.

Parameter	Parameter name	Range 【Default】	Change mode
P19.09	Analogue output AO function select	P01.01 ~ P18.08 【0.00】	Run & Stop

Selects the function of the analogue output terminal AO

The set up is similar to the ID700 relays. See the ID700 Advanced User Manual for details.

Parameter	Parameter name	Range 【Default】	Change mode
P19.10	Digital input X1 invert	0 (OFF) ~ 1 (ON) 【0】	Run & Stop
P19.11	Digital input X2 invert	0 (OFF) ~ 1 (ON) 【0】	Run & Stop
P19.12	Digital input X3 invert	0 (OFF) ~ 1 (ON) 【0】	Run & Stop

Setting to a 1 causes the digital input state to be inverted.

Parameter	Parameter name	Range 【Default】	Change mode
P19.13	Not used		

Parameter	Parameter name	Range 【Default】	Change mode
P19.14	Digital input X1 state	0 ~ 1 【0】	Run & Stop
P19.15	Digital input X2 state	0 ~ 1 【0】	Run & Stop
P19.16	Digital input X3 state	0 ~ 1 【0】	Run & Stop

Indicates the status of the digital inputs:

0 : OFF

1 : ON

Parameter	Parameter name	Range 【Default】	Change mode
P19.17	Analogue input mode select	0 ~ 6 【6】	Stop only

Used to select the input type on terminal AI. The input signal can be voltage or current.

**0** : 0mA to 20mA  
**1** : 20mA to 4mA  
**2** : 4mA to 20mA  
**3** : 20mA to 4mA  
**4** : Reserved  
**5** : Reserved  
**6** : 0V to +10V

**NOTE:** When P19.17 is set to mode 2 or 3, P19.24 is set to a 1 if the analogue input current value is less than 3mA.

Parameter	Parameter name	Range 【Default】	Change mode
P19.18	Analogue input offset	-100.0% ~ 100.0% 【0.0%】	Run & Stop

Used to apply an offset to the analogue input.

**NOTE:** If the sum of the analogue input and the offset exceeds  $\pm 100\%$ , the result is limited to  $\pm 100\%$ .

Parameter	Parameter name	Range 【Default】	Change mode
P19.19	Analogue input scaling	0.000% ~ 20.000% 【1.000】	Run & Stop

Used to apply a scaling factor to the analogue input.

Parameter	Parameter name	Range 【Default】	Change mode
P19.20	Analogue input filtering time	0.00s ~ 10.00s 【0.10s】	Run & Stop

Used to apply a filtering time to the analogue input.

**NOTE:** If the value of this parameter increases, the filtering effect increases but the processing time gets longer and the response time becomes slower.

If the value of this parameter decreases, the filtering effect decreases but the processing time gets shorter and the response time faster.

Parameter	Parameter name	Range 【Default】	Change mode
P19.21	Analogue input invert	0 ~ 1 【0】	Run & Stop

Used to invert the analogue input signal (analogue signal multiplied by -1).

Parameter	Parameter name	Range 【Default】	Change mode
<b>P19.22</b>	Analogue input upper limit	0.0% ~ 100.0% 【100.0%】	Run & Stop
<b>P19.23</b>	Analogue input lower limit	0.0% ~ P19.22 【0.0%】	Run & Stop

Used to limit the analogue input signal.

The analogue input will be limited to between the value of P19.23 and P19.22 after the analogue input offset (P19.18), scaling (P19.19) or inverting (P19.21) have been calculated.

Parameter	Parameter name	Range 【Default】	Change mode
<b>P19.24</b>	Analogue input current disconnect display	0 ~ 1	Read Only

When P19.17 is set to 2 or 3, this parameter is set to 1 if the analogue input current value is less than 3mA.

Parameter	Parameter name	Range 【Default】	Change mode
<b>P19.25</b>	Analogue input signal level	0.0% ~ 100.0%	Read Only

Actual level of analogue input in % (before offset and scaling are applied).

Parameter	Parameter name	Range 【Default】	Change mode
<b>P19.26 to P19.30</b>	Not used		

Parameter	Parameter name	Range 【Default】	Change mode
<b>P19.31</b>	User 5V/24V select	0 ~ 1 【0】	Stop Only

Terminal +P on the HDOM-IO-Logic can be 5V or 24V power supply.

**0** : Output is +5VDC

**1** : Output is +24VDC

Parameter	Parameter name	Range 【Default】	Change mode
<b>P19.32</b>	Not used		

Parameter	Parameter name	Range 【Default】	Change mode
<b>P19.33</b>	Relay invert	0 ~ 1 【0】	Run & Stop

Setting to a 1 causes the relay output state to be inverted.

Parameter	Parameter name	Range 【Default】	Change mode
<b>P19.34</b>	Relay state	0 ~ 1 【0】	Read Only

Indicates the state of the relay.

**0** : Open

**1** : Closed

Parameter	Parameter name	Range 【Default】	Change mode
P19.35	Digital output invert	0 ~ 1 【0】	Run & Stop

Setting to a 1 causes the digital output state to be inverted.

Parameter	Parameter name	Range 【Default】	Change mode
P19.36	Digital output state	0 ~ 1 【0】	Read Only

Indicates the state of the digital output.

0 : Output = 0V

1 : Output = 24V

Parameter	Parameter name	Range 【Default】	Change mode
P19.37	Analogue output scaling	0.000% ~ 20.000% 【1.000】	Run & Stop

Used to apply a scaling factor to the analogue output.

Parameter	Parameter name	Range 【Default】	Change mode
P19.38	Analogue output mode select	0 ~ 4 【4】	Stop only

Used to select the output type on terminal AO. The output signal can be voltage or current.

0 : 0mA to 20mA

1 : 20mA to 4mA

2 : 4mA to 20mA

3 : 20mA to 4mA

4 : 0V to +10V

Parameter	Parameter name	Range 【Default】	Change mode
P19.39	Analogue output signal level	0.0% ~ 100.0%	Read Only

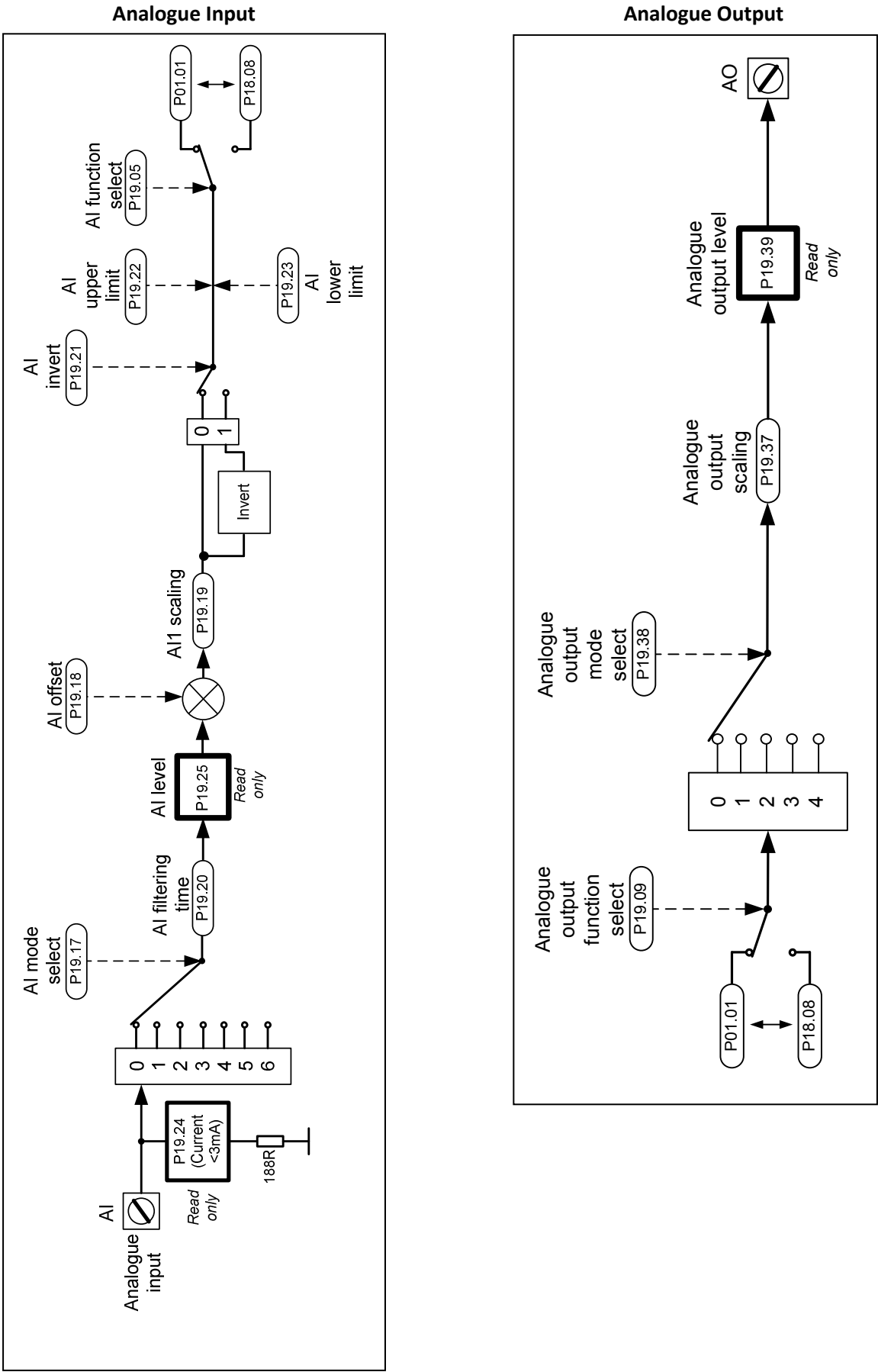
Actual level of analogue output in %.

Parameter	Parameter name	Range 【Default】	Change mode
P19.40	IDOM IO Logic Module software version	0.00 ~ 02.99	Read Only

Parameter	Parameter name	Range 【Default】	Change mode
P19.41	IDOM IO Logic Module hardware version	0.00 ~ 02.99	Read Only

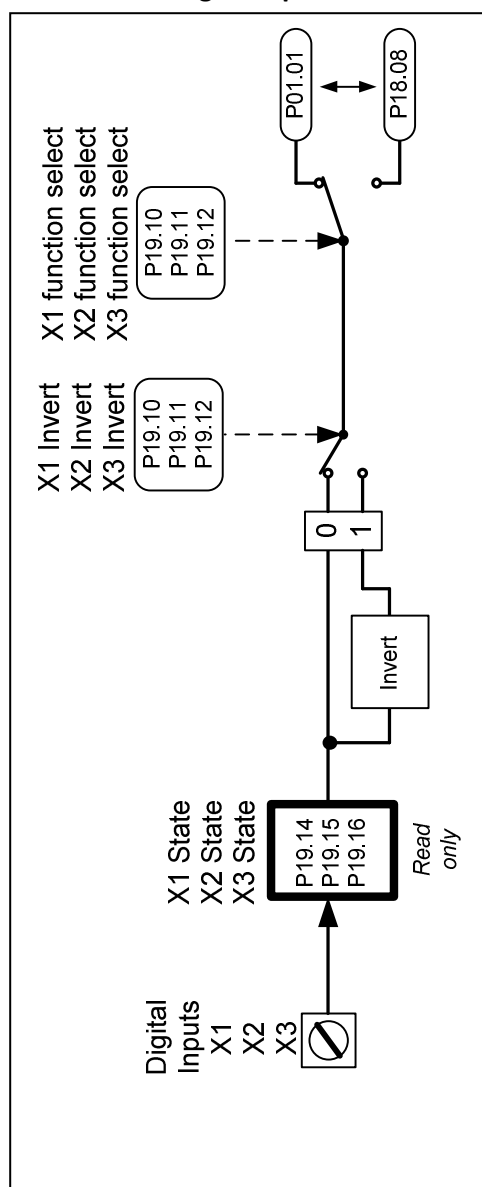
Parameter	Parameter name	Range 【Default】	Change mode
P19.42 to P19.99	Not used		

6. Analogue Input and Output Logic Diagrams

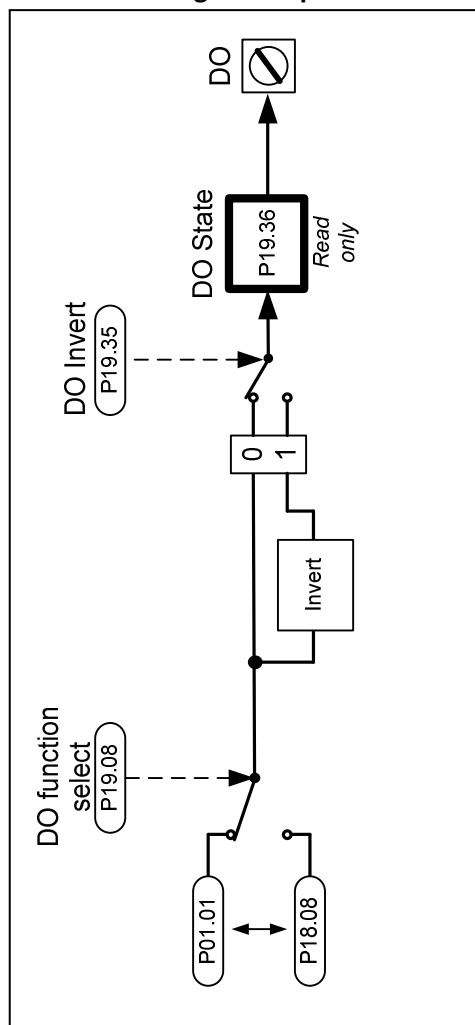


# Digital Input and Output Logic Diagrams

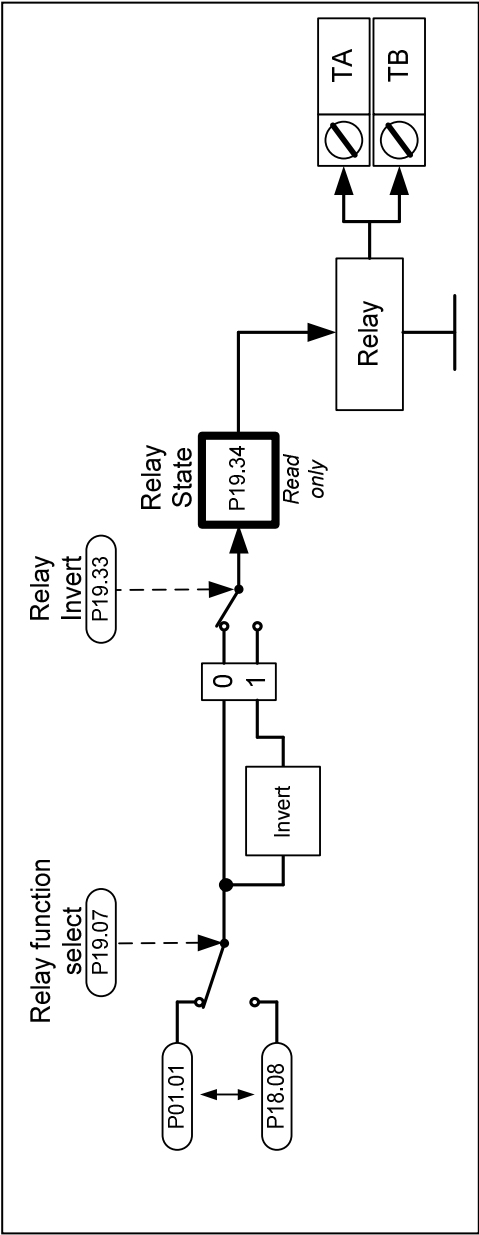
Digital Input



Digital Output

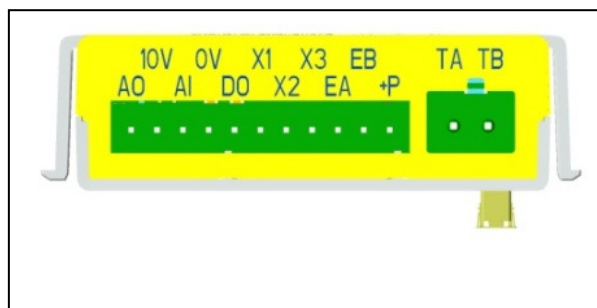


Relay Output Logic Diagram





Parameter	Parameter name	Setting
P19.02	Digital input X1 function select	
P19.03	Digital input X2 function select	
P19.04	Digital input X3 function select	
P19.05	Analogue input AI function select	
P19.07	Relay TA & TB function select	
P19.08	Digital output DO function select	
P19.09	Analogue output AO function select	
P19.10	Digital input X1 invert	
P19.11	Digital input X2 invert	
P19.12	Digital input X3 invert	
P19.14	Digital input X1 state	
P19.15	Digital input X2 state	
P19.16	Digital input X3 state	
P19.17	Analogue input mode select	
P19.18	Analogue input offset	
P19.19	Analogue input scaling	
P19.20	Analogue input filtering time	
P19.21	Analogue input invert	
P19.22	Analogue input upper limit	
P19.23	Analogue input lower limit	
P19.24	Analogue input current disconnect display	
P19.25	Analogue input signal level	
P19.31	User 5V/24V select	
P19.33	Relay invert	
P19.34	Relay state	
P19.35	Digital output invert	
P19.36	Digital output state	
P19.37	Analogue output scaling	
P19.38	Analogue output mode select	
P19.39	Analogue output signal level	



AO	10V	AI	0V	DO	X1	X2	X3	NC	NC	+P
----	-----	----	----	----	----	----	----	----	----	----

TA	TB
----	----