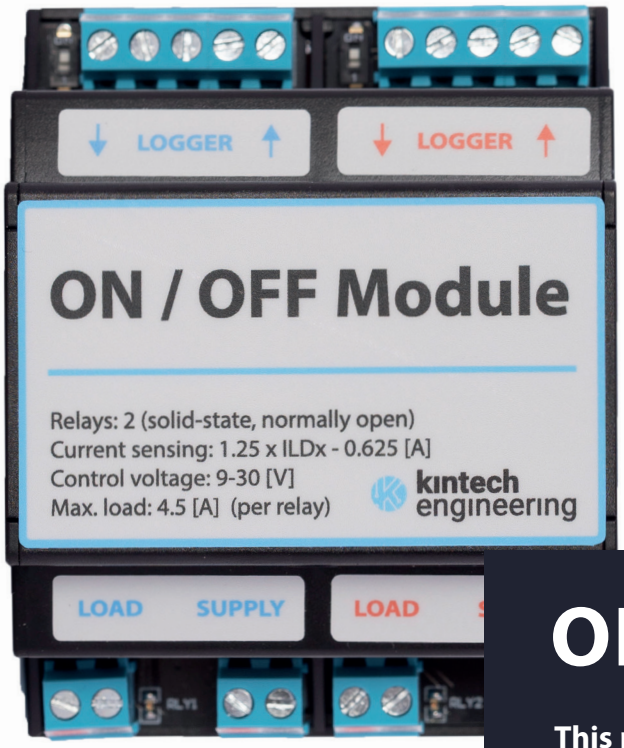
kintech engineering



ON / OFF MODULE

This module, when used in combination with the Orbit 360 data logger can be used to activate/deactivate power applications including obstruction lights or heated sensors.

Kintech Engineering's ON/OFF Module is designed to control the power applications that may typically be needed in a wind/solar measuring installations such as activating and monitoring beacon lights or heating sensors.

The ON/OFF Module uses the control signals of any of the six programmable outputs featured in the Orbit 360 data logger to connect or disconnect a load from its power supply. Each module comprises two solid-state relays, enabling the control of two independent power circuits.

Solid-state relays (SSRs) are electronic switching devices that activate or deactivate when an external voltage is applied to their control terminals. While they serve the same purpose as electromechanical relays, they consume significantly less power than conventional electromechanical relays and have no moving parts, resulting in a longer operational lifespan. By integrating an on-chip optocoupler, the SSR also ensures that the control is electrically isolated.

Up to three outputs can be used to control each module by means of Boolean AND/OR logic (see diagram on page 3). Typical use for the AND logic would be to activate a signal when, for instance, the temperature falls below 0°C AND the relative humidity goes beyond 70%. When a single signal is sufficient to control the relay activation, leave the CTAx terminals unconnected and just connect the control signal to the CTOx terminal. Each relay is assigned an LED that indicates whether it is open/inactive (LED off) or closed/activated (LED on).

ON / OFF MODULE | CONTROL POWER APPLICATIONS

In order to detect failures on both the load side (such as a broken beacon) and the power side (such as a dead battery) the ON/OFF module includes two outputs that monitor the current flowing through each relay. These outputs can be connected to any analog channel of the logger. The current is measured by hall effect, thus maintaining galvanic isolation between the power and control sides. Two microswitches allow the user to disconnect the hall meters to save consumption in case they are not going to be used.

The transfer function relating the module ILDx output to the current through relay x is as follows:

Current through Relay 1 [A]=1.25 x ILD1-0.625
Current through Relay 2 [A]=1.25 x ILD2-0.625

In case you want to monitor the voltage together with the current measurement, a commercial voltage divider from Kintech Engineering can be used, connected to a separate analog channel of the data logger.

SPECIFICATIONS

Number of relays	2
Relay operational function	Single-side stable type
Relay technology	Solid-state relay (SSR) with optocoupler
Relay contact type	Normally open (NO)
Control voltage (CTxx terminals)	9 to 30 V
Max. current load (per relay)	4.5 A
Max. voltage (load side)	60 V
Polarity (load side)	Unipolar [1] (-36 V reverse polarity protected)
Galvanic isolation load - control	420 V
Current sensing [A]	1.25 x ILDx – 0.625
Current sensing interfacing	To analog logger channel (0-5V input or greater)
Required power supply	Self-supplied through control voltage terminals [2]
Supply current (@ 12V)	7 mA (current sensing OFF)
	19 mA (one current sensor ON)
	32 mA (both current sensors ON)

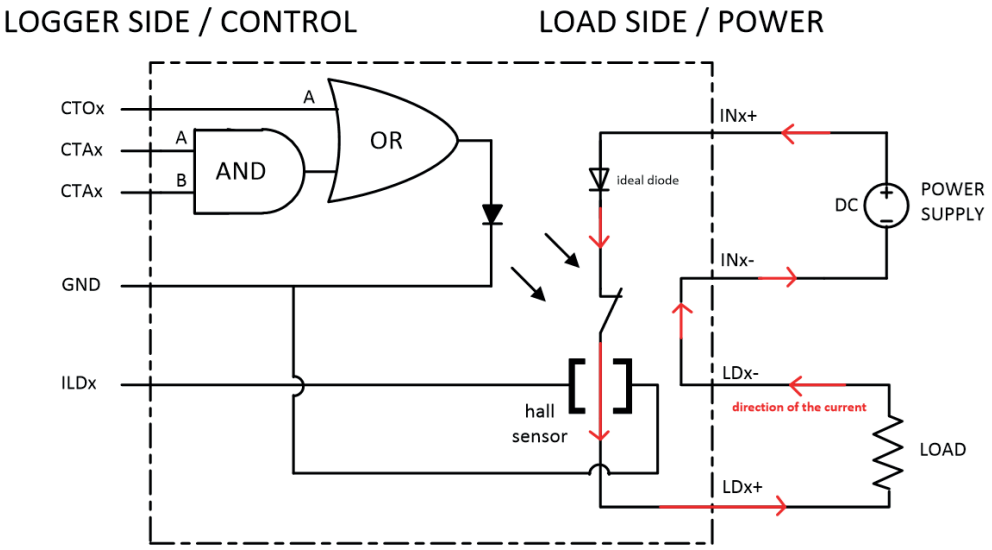
[1] – Current must enter the relay via INx+ terminals and exit via LDx+ terminals.
[2] – The ON/OFF module does not need a dedicated power supply; it is capable of powering its internal electronics from any of the control terminals whenever any of them is activated.

SENSOR WIRING TABLE

ON/OFF Module		ORBIT 360			Power supply system	Load
Section	**Terminal**	**Section**	**Terminal**	**Type**	**Terminal**	**Terminal**
LOGGER	CTA1, CTA1, CTO1, CTA2, CTA2, CTO2	Analog Channels	67, 71, 75, 79, 83, 89	Output		
	GND, GND*		47, 51, 55, 59, 64, 68, 72, 76, 80, 87	(-)		
	ILD1, ILD2		48, 52, 56, 60, 65, 69, 73, 77, 81, 84	Signal		
SUPPLY	IN1+, IN2+				(+)	
	IN1-, IN2-				(-)	
LOAD	LD1+, LD2+					(+)
	LD1-, LD2-					(-)

* Preferably do only connect one.

FUNCTIONAL DIAGRAM



LABEL	DESCRIPTION	SECTION	CONNECTED TO
LEFT SIDE (RELAY #1)			
CTA1	*Input A to AND gate function*	*LOGGER*	*OUT1, OUT2, OUT3… OUT6*
CTA1	*Input B to AND gate function*	*LOGGER*	*OUT1, OUT2, OUT3… OUT6*
CTO1	*Input A to OR gate function*	*LOGGER*	*OUT1, OUT2, OUT3… OUT6*
GND	*Control ground*	*LOGGER*	*Any (-)*
ILD1	*Current measurement*	*LOGGER*	*Any analog input channel*
IN1+	*Power supply (+)*	*SUPPLY*	*Positive battery terminal*
IN1-	*Power supply (-)*	*SUPPLY*	*Negative battery terminal*
LD1+	*Load (+)*	*LOAD*	*High voltage load side*
LD1-	*Load (-)*	*LOAD*	*Low voltage load side*
RIGHT SIDE (RELAY #2)			
CTA2	*Input A to AND gate function*	*LOGGER*	*OUT1, OUT2, OUT3… OUT6*
CTA2	*Input B to AND gate function*	*LOGGER*	*OUT1, OUT2, OUT3… OUT6*
CTO2	*Input A to OR gate function*	*LOGGER*	*OUT1, OUT2, OUT3… OUT6*
GND	*Control ground*	*LOGGER*	*Any (-)*
ILD2	*Current measurement*	*LOGGER*	*Any analog input channel*
IN2+	*Power supply (+)*	*SUPPLY*	*Positive battery terminal*
IN2-	*Power supply (-)*	*SUPPLY*	*Negative battery terminal*
LD2+	*Load (+)*	*LOAD*	*High voltage load side*
LD2-	*Load (-)*	*LOAD*	*Low voltage load side*