swampfox

Pump Station Controller

Models SF1 and SF3

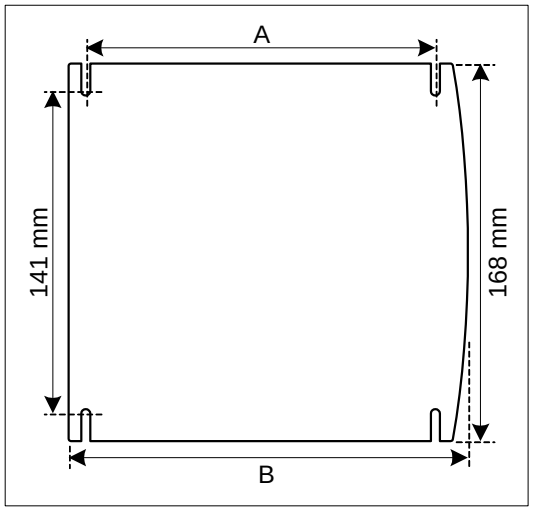
Installation Guide

µAbbey SYSTEMS

Mounting

Mount *swamp**fox*** against a flat surface using four M5 screws.

	Screw Spacing		Outside Dimensions	
Model	**Horizontal (A)**	**Vertical**	**Width (B)**	**Height**
SF1	153 mm	141 mm	175 mm	168 mm
SF3	217 mm	141 mm	240 mm	168 mm

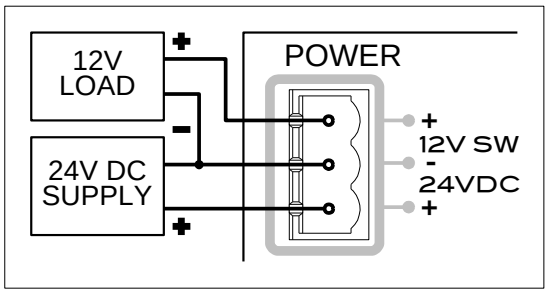


Mounting Template

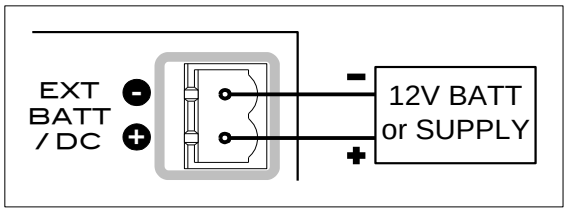
Depth is 125mm, plus front clearance for wiring (at least 70mm for antenna jack)

Powering

Arrangement	Voltage (nominal, min~max)	Rating	Apply Power to	Backup Battery
24V DC	27.6V DC (24.0~36.0V DC)	48W	POWER	Internal or External
12V DC	13.8V DC (12.5~15.0V DC)	3A	EXT BATT/DC	Nil



24V DC Supply & External Load



12V DC Supply or External Battery

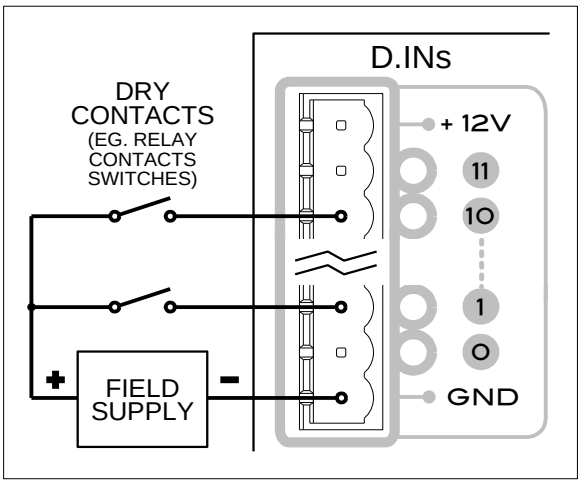
An external power option can be installed in *swamp**fox*** that can provide a switched 13.8V supply up to 1A through pins 2 and 3 of the power connector as shown. This can be used to power an external device such as a cellular modem.

With the 12V DC powering arrangement, a 12V DC supply is fed into the **EXT BATT/DC** connector. This connection is also used to charge an external SLA battery when the *swamp**fox*** is powered via the **POWER** connection. When the **POWER** connector is not used, the *swamp**fox***'s internal battery must be removed.

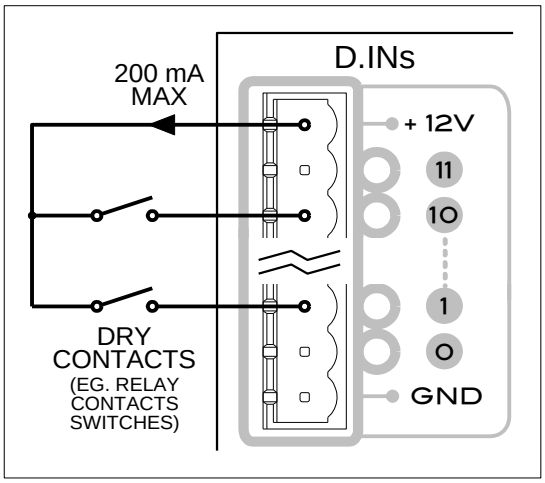
Connect an antenna before powering up *swampfox***

Digital Inputs

General Description	Inactive, LED off	Active, LED on	Maximum	Resistance
Positive voltage-activated	0~+1.8V	+4.5~36.0V	±60V DC	12kΩ to GND

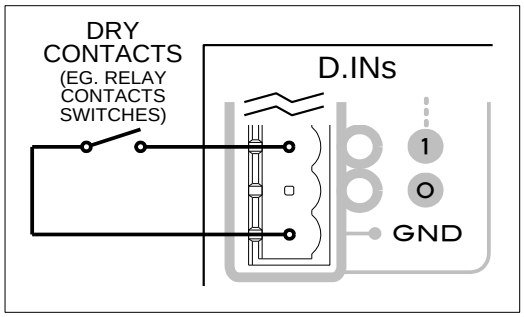


Digital Inputs – Externally Powered



Digital Inputs – Internally Powered

By default Digital Inputs 0..3(, 12..15, 24..27 for SF3) are assigned to Pulse Counts or Rates 0..3(, 4..11 for SF3). If Microlink-compatible pulse input mapping is configured in Powerlink then Digital Inputs 9..6(, 21..18, 33..30) are mapped to Pulses or Rates 0..3(, 4..11).



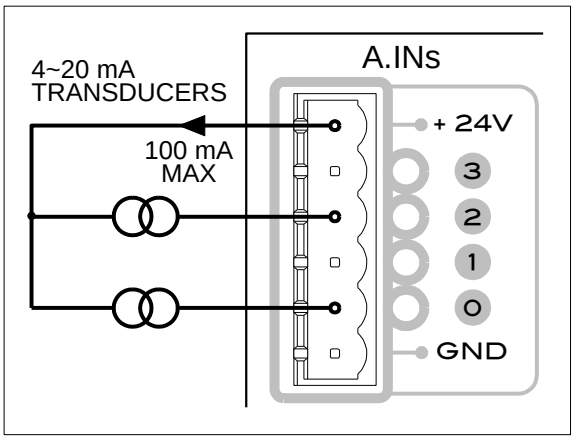
Digital Inputs – Internal Pullup

For RTUs with a **–d** suffix, the Digital Inputs are internally pulled up to the 12V rail.

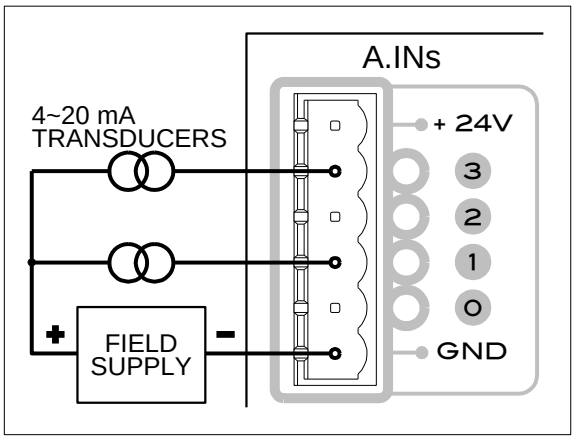
The are activated by pulling the input to **GND** via a switch or relay contact.

Analog Inputs

General Description	Inactive, LED off	Active, LED on	Maximum	Resistance
Positive 4~20mA current	0~+4mA	+4~20mA	±5V ±40mA	120Ω to GND



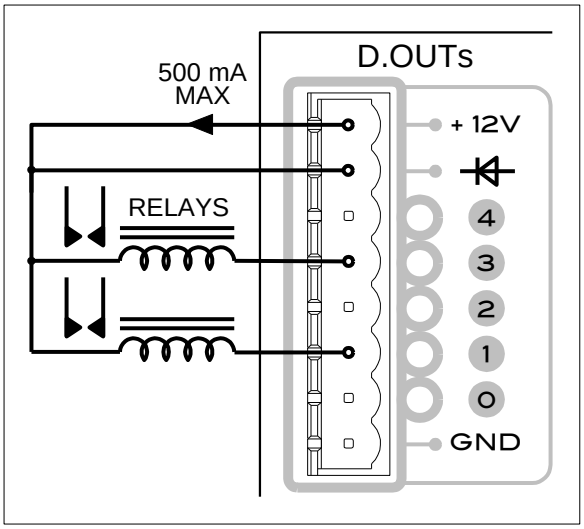
Analog Inputs – Internally Powered



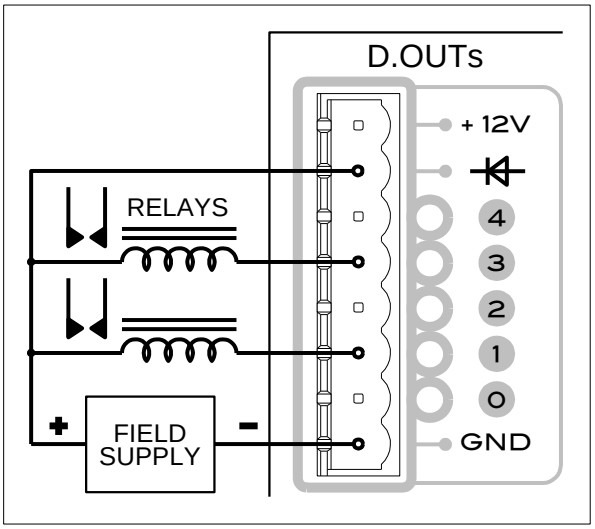
Analog Inputs – Externally Powered

Digital Outputs

Open-collector type outputs which close to **GND** when activated. Each can switch and carry up to 100mA from a supply of up to +40V DC.



Digital Outputs – Internally Powered

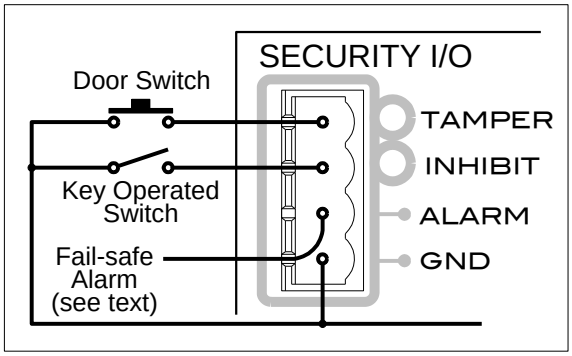


Digital Outputs – Externally Powered

The pin with the diode symbol must be connected to the positive rail from which any inductive loads are powered, to protect *swamp**fox*** against back EMF.

Security I/O

The fail-safe alarm is an open collector, which can carry 50mA, up to 30V, and can drive a relay coil directly.



Security I/O

Serial Ports

Name	Type	Socket	Typically used for…
PORT 1	RS-232	RJ-45[1]	Local connection to PLC, data logger, meter
PORT 2	RS-232	RJ-45	Local connection to PLC, data logger, meter
CONFIG	RS-232	RJ-45	Laptop, Analog output module

[1] Connector pins 2 and 3 are not connected on **PORT 1**.

[2] The +12V outputs can power small loads such as serial converters.

Each port has a red/green LED indicator, which blinks green when *swamp**fox*** receives a valid message. Red indicates an error condition.

	Dir	Name
1	sf→	+12V[2]
2[1]	sf→	COut2
3[1]	sf←	CIn2
4	sf→	COut1
5	sf←	CIn1
6	sf→	TxD
7	sf←	RxD
8		GND

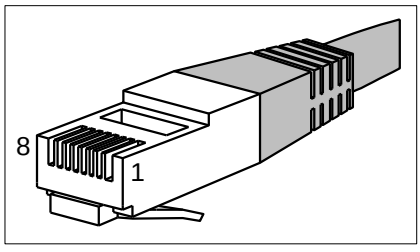
Serial ports can be permanently damaged if an Ethernet cable is plugged into them.

Ethernet Port

This is a standard 100-base-T Ethernet port, which is operational when the appropriate firmware is installed.

External Radio Connections

These connections are applicable only when no internal radio is fitted.



RJ45 Pins

Pin	Dir	Name
1		GND
2	sf→	PTT
3	sf←	Channel Busy
4	sf→	Tx Audio
5	sf←	Rx Audio
6	sf→	Serial TxD
7	sf←	Serial RxD
8		GND

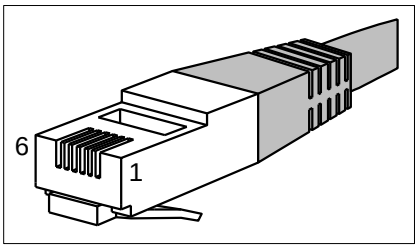
Always use best radio-frequency engineering practices for all radio and antenna installation.

Connect an antenna <u>before</u> powering up *swampfox***

Speaker / Microphone Connections

A suitable Speaker / Microphone connection is provided on units with an internal radio for monitoring and testing the radio channel.

Pin	Name
1	N/C
2	Speaker
3	PTT
4	Microphone
5	GND
6	GND



RJ12 Speaker Mic Pins

Communication Indicators

The **COMMS** indicators show communication between *swamp**fox*** and the Telemetry Master.

Indicator	Indication	Meaning
VAD/COMMS	Green short blink	A valid message for a *different* RTU was received
	Green long blink	A valid message for *this* RTU was received
	Red	Comms fail (no comms with the Master)
CHAN BUSY	Yellow	The radio transceiver is receiving RF on it's channel
RX DATA	Yellow	Shows the data being received by *swamp**fox***
PTT	Yellow	*swamp**fox*** is transmitting on the radio channel
TX DATA	Yellow	Shows the data being transmitted by *swamp**fox***

A short blink is about 0.1 seconds. A long blink is about 0.5 seconds.

Ready LED and Reset

Ready LED indication	*swamp**fox*** operating state	
Green	Normal	*swamp**fox*** is operating normally
Red	Defect	Hardware or firmware fault

The COMMS LED (if present) above the Ready LED lights red when f is in comms fail to a master.

The **RESET** button is behind a small unmarked hole in the front panel near the **DISPLAY** button. To reset and restart *swamp**fox***, press **RESET** briefly.

Mains and Battery LEDs

The *swamp**fox***'s internal battery charger charges the internal battery, or an external 12V sealed lead acid battery (6Ah or more) connected to the **EXT BATT/DC** connector. While power is present, the **MAINS** and **BATT** indicators show *swamp**fox***'s state:

Mains LED	**Battery LED**	***swamp**fox* **power, charger and battery status**	
Green	Green	Normal	**POWER** energized, battery OK, not charging
Red	Green	Backup	**POWER** not energized, running from battery
Either	Red	Battery Low	Battery voltage low (or battery disconnected)
Unlit	Green	12V Powered	Powered through **EXT BATT/DC**
Green	Green flashing	Charging	
Green	Red flashing	Charge Failure	Mains failed while charging, or faulty battery

Other Front Panel Items

The **COMMS** LED illuminates red when *swamp**fox*** cannot communicate with a master.

The **DISPLAY** button turns the front panel indicators on and off. The ready LED is always enabled.

The **ADDRESS SWITCHES** set *swamp**fox***'s three digit RTU address.

***swamp**fox* only examines the address switches when it starts up or is reset**

All **GND** pins, the **EXT BATT/DC** connector negative pin, and the antenna shield, are all connected inside the *swamp**fox***.

Copyright © 2006-2015 Abbey Systems Ltd

www.abbey.co.nz

support@abbey.co.nz

Level 3, 220 Willis Street
PO Box 27-497
Wellington, New Zealand

Phone +64-4-385-6611
Fax +64-4-3856848

Document Number	**IG-619-2.2-2015-Mar**
Products Covered	**SF1 and SF3 (all variants)**
Revision Number	**2.2**
Revision date	**15 March 2015**

*swamp**fox*** **and the** *swamp**fox*** **logo are trademarks of**
Abbey Systems Ltd, registered with the U.S. Patent and Trademark Office.