POWERCAT

Communications Controller
Model PC-CC

Installation Guide

µAbbey
SYSTEMS
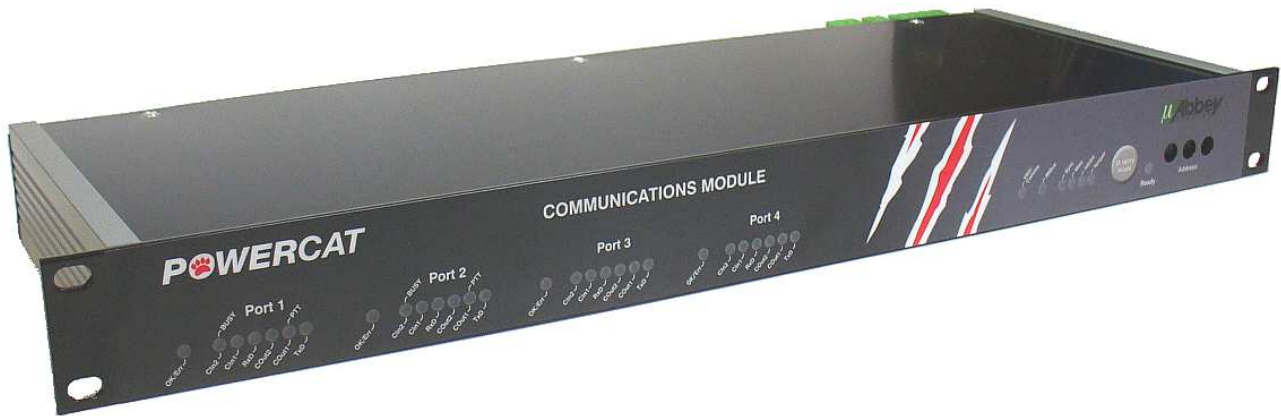
Introduction

The Powercat Communications Controller is a modular integrated RTU communication and control module with serial ports, in a 1U-high 19-inch rack-mount enclosure. Depth is 175 mm plus room for rear wiring. As shown below, the back panel has a general area, and four port areas, each of which may contain an external comms interface, an isolated serial port, or a blanking panel.
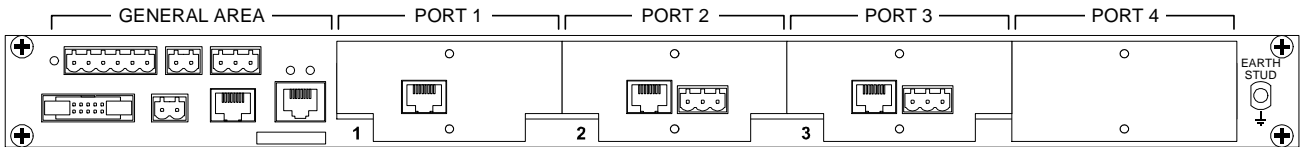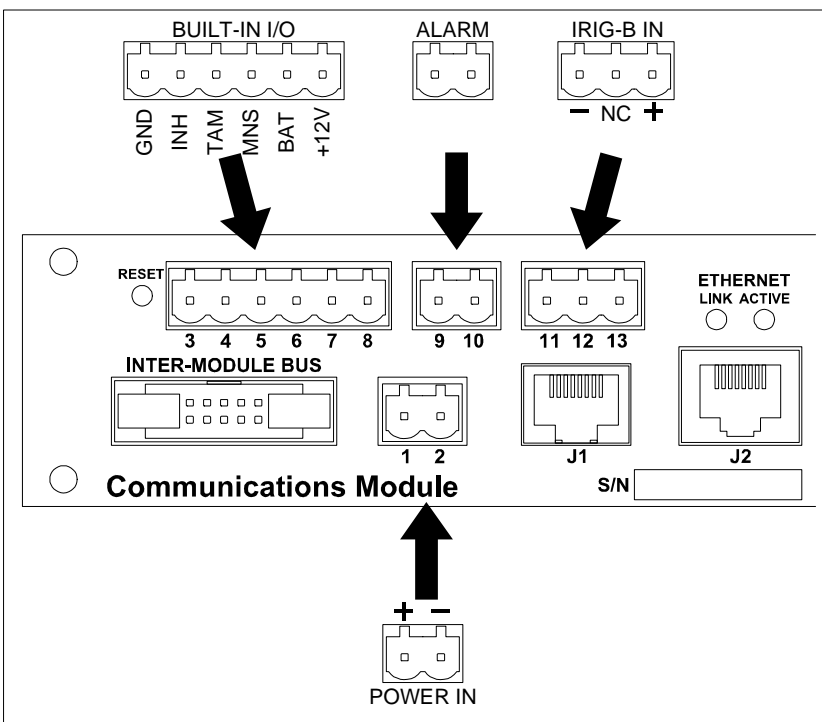

Fig 1 Back Panel

General Area

Fig 2 General Area

Connectors that relate to the whole module are in the general area. Descriptions can be found on the next page.

BUILT-IN I/O, **ALARM**, **IRIG-B IN** and **POWER IN** are plug/socket connectors; these accept wires up to 2.5mm in diameter.

To reset the module, insert a straightened paper clip or similar tool through the small hole marked **RESET** to push the button inside.

👉 The **EARTH STUD**, at the opposite end of the module, must be firmly connected to a good safety earth.

⚠️ **Config port J1 can be permanently damaged if an Ethernet cable is plugged into it.**

General Area Connector Description

Connector/Pin	Description
1,2 POWER IN	Accepts power into the module, nominally 24V DC (allowable range is 18.0~32.0V). Typical power consumption is 2.4 watts (100 mA at 24.0V).
BUILT-IN I/O:	Carries several non-isolated alarm signals and a +12V output:
3 GND	Common ground rail. Internally connected to the negative pin of POWER IN.
4 INH	Inhibit input; connect through a key operated switch (or similar) to GND. When closed, the master will suppress alarms generated at the site.
5 TAM [1]	Tamper input; connect through a door switch (or similar) to GND. The switch must be closed while the site is secure, and open to indicate tampering.
6 MNS [1]	Mains Fail signal from an external charger or power supply if present.
7 BAT [1]	Battery Low signal from an external charger or power supply if present.
8 +12V	Power Output; +12V DC, 250mA continuous.
9,10 ALARM	A normally closed single pole relay output. Opens if the module fails or loses communication with the master. Isolated to 250V AC, and can switch up to 500mA at 110V DC/125V AC
11-13 IRIG-B	Accepts an unmodulated IRIG-B signal, e.g. from a TimeSync 2 unit. Input is isolated to 500V, Series B, per IEC 60255-5.
INTER-MODULE BUS	Connects through a 10-way ribbon cable to other Abbey Systems modules.
J1	Config port; a non-isolated RS-232 port (RJ-45 connector) for local interrogation and configuration using Powerlink Local Master software.
J2	Standard 10/100 base-T Ethernet connector with status indicators.

☞ When adding a module, always plug in the **POWER IN** connector before plugging in the **INTER-MODULE BUS.**

[1] The **BAT**, **MNS** and **TAM** inputs are fail-safe with an internal pull up to +3.3V. In the non-alarm state, the external circuit must pull the pin to **GND**, and release the pin in an alarm state. If no suitable signal exists to drive the input, link the pin to **GND**.

External Comms Interface Card (PC-CC-FF / B07-021)


Fig 3 External Comms Card
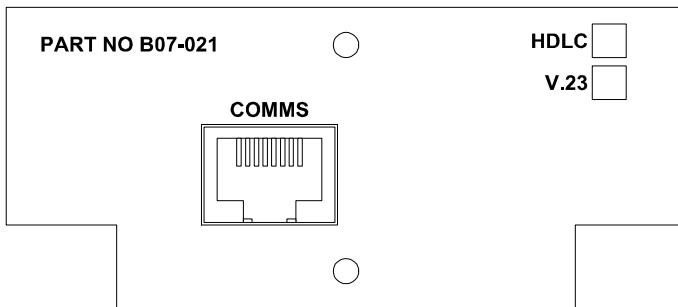
This port interfaces to a communication bearer (usually a radio or twisted pair line) to provide communication with a SCADA Master using modulated audio.

Pin	Name		Dir	Description
1,8	GND	Ground	-	Module ground. Common for all signals.
2	-PTT	Push To Talk	→	Open collector output; module pulls line low to transmit.
3	-CHB	Channel Busy	←	Radio pulls this line low while channel is busy.
4	TXA	Transmit Audio	→	Transmit audio. Level is software configurable.
5	RXA	Receive Audio	←	Receive Audio. Range 30~1000mV RMS.
6	TXD	Transmit Data	→	RS-232 data to intelligent radio transceiver.
7	RXD	Receive Data	←	RS-232 data from intelligent radio transceiver.

Serial Port Card (PC-CC-RS / B07-022)

Fig 4 Serial Port Card
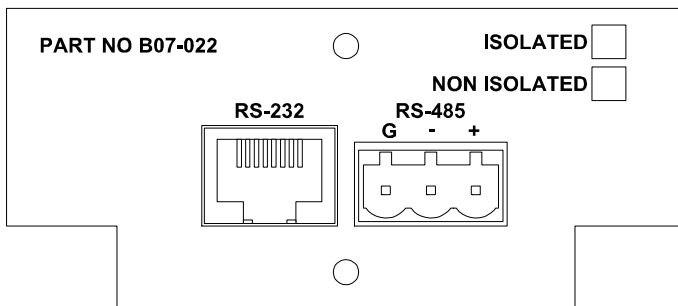
The Serial Port supports RS-232 and RS-485 (selected through site config) and has electrical isolation.

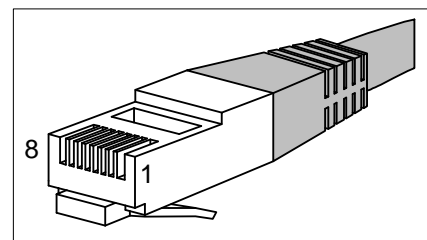| Pin	Name		Dir
1	+5V	Supply Rail	→
2	COut2	Control Out 2	→
3	CIn2	Control In 2	←
4	COut1	Control Out 1	→
5	CIn1	Control In 1	←
6	TXD	Transmit Data	→
7	RXD	Receive Data	←
8	GND	Ground	-

Fig 5 RJ45 Pins

Pin1 of the RS-232 connector can supply +5V DC at a maximum of 30mA. It can also be used as an always-active flow control output.

On the RS-485 connector, **G** is the isolated ground, and depending on the documentation used:

- is 'Data –', 'Data B' or 'Inverted Data'

+ is 'Data +', 'Data A' or 'Non-Inverted Data'

Port Indicators

Each port has an associated block of front panel indicators. **OK / ERR** blinks green when the port receives a valid message, and shows red if there is a problem.
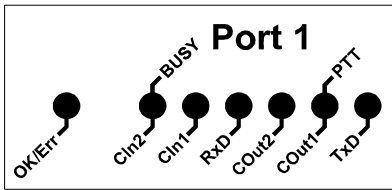

Fig 6 Port Indicator LEDs

For a serial port, the remaining indicators show data and flow control signals.

For an External Comms port they have the following meaning:

Indicator	Function	Meaning when Illuminated
OK / Err	Comms State	Green blink = valid message; Red = comms failure.
CIn 2	Channel Busy	Comms channel is active.
CIn 1	-	Not used.
RxD	Received Data	Data is being received on the channel.
COut 2	-	Not used.
COut 1	PTT	Radio is transmitting on the channel.
TxD	Transmit Data	Data is being transmitted on the channel.

Front Panel General Area

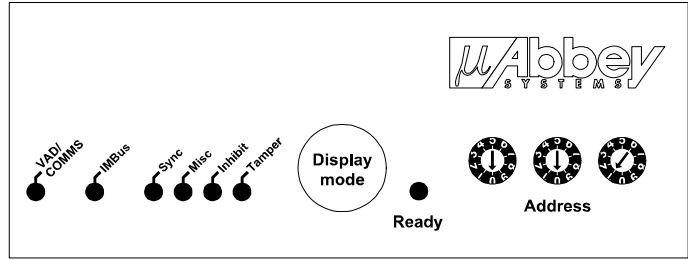The right hand end of the front panel has general indicators and controls that relate to the whole module.

Fig 7 Front Panel General Area

Indicator	Indication	Meaning
VAD/Comms	Green, short [2] blink	A valid message for a different RTU was received.
	Green, long [2] blink	A valid message for this RTU was received.
	Red	RTU is in Comms Fail state (no comms with Master).
IMBus	Green	The inter-module bus is operating correctly.
	Red (blink or steady)	Indicates an intermittent or permanent problem on the IMB.
Sync	Yellow	RTU time synchronization state: Blinking = high accuracy, Steady = medium accuracy
Misc	Yellow	Not normally used.
Inhibit	Yellow	The **INHIBIT** input is active and alarms will not be generated for this site.
Tamper	Yellow	The TAMPER input is active.
Display	-	Press this button to toggle the LED display of connected modules on and off.
Ready	Green	Normal operation. This LED is always on.
	Red	General fault. The RTU is non operational.
Address	-	Three rotary switches set the address of the RTU.

[2] A short blink is about 0.1 seconds. A long blink is about 0.5 seconds.

☞ The module only examines the address switches when it starts up or is reset.

Related Products

Name	Part #	Description
GPS Timesync 2 receiver	B07-061	IRIG-B and 1PPS synchronized from GPS
RS-485 serial adaptor	B06-071	RS-232 to RS-485 serial converter
Foxcub fibre-optic adaptor	B06-074	RS-232 to fibre-optic converter (plastic or glass)
Cable for PC or laptop	CAB-LM-PL	Cable from the Config Port J1 to a D9 serial port
Powercat Digital Inputs	PC-DI	Isolated 40 Digital Input Module
Powercat Digital Outputs	PC-DO	Isolated 40 Digital Output Module
Powercat Analog Inputs	PC-AI	Isolated 16 Analog Input Module