



User Manual

PDAQ

Flow Management Devices

Part Number: 000-102665-DOC Rev A

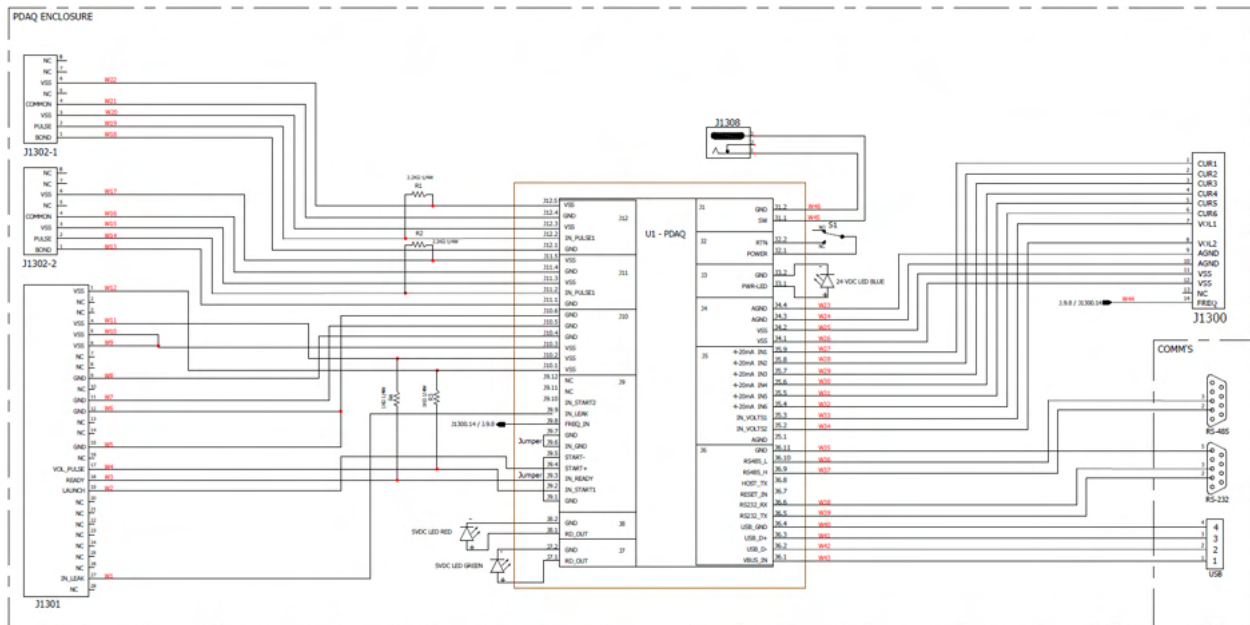
5225 South 37th St. Suite 4 Phoenix, AZ 85040 _ Phone (602) 233-9885 _ Fax (602) 233-9887 _ Website: www.FlowMD.com

1.0 INTRODUCTION – the Prover Data Acquisition Module (**PDAQ**) is an interface between a compact prover and a flow computer. The PDAQ has the following features.

- 6 current inputs 0 to 20 ma, scalable
- 2 voltage inputs 0 to 2.5 V
- 2 Turbine meter Double Chronometry channels – pulse, 0 – 20 Khz
- 1 Frequency input (densitometer), 0 - 4Khz
- 6 Condat compatible prover status, start, and volume pulse IO
- 1 RS232/485/USB IO Condat/Prove-It emulation port
- 1 RS232 proprietary protocol port
- 1 Power input 8 to 32 VDC less than 2 watts

The double chronometry function on two channels is done completely internally with the floating-point result available on the proprietary serial port. A partial result is proved on the Condat/Prove-it interface that requires the final calculations to be done in the flow computer emulating the Condat. The cable connections and connectors are compatible to Condat.

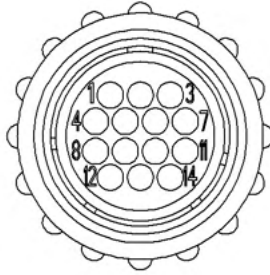
2.0 SIGNAL DESCRITPION – the following is a schematic of the user signal connections from FlowMD P/N 000-105842-DOC.



Connector J1 – Power Plug (2.5mm Coax Plug)

PIN	Name	Description
1	Vuser	User power supply 11 to 28 VDC 2 watts
2	Power Ground	User power supply ground

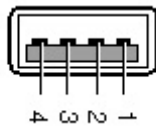
14 PIN Analog Connector (AMP 206042-1 mates to 206044-1)



PIN	Name	Description
1	Input Channel 0	0 to 20 Current input – 12b ADC 120-ohm load
2	Input Channel 1	0 to 20 Current input – 12b ADC 120-ohm load
3	Input Channel 2	0 to 20 Current input – 12b ADC 120-ohm load
4	Input Channel 3	0 to 20 Current input – 12b ADC 120-ohm load
5	Input Channel 4	0 to 20 Current input – 12b ADC 120-ohm load
6	Input Channel 5	0 to 20 Current input – 12b ADC 120-ohm load
7	Input Channel 6	0 to 2.5v Voltage input – 12b ADC
8	Input Channel 7	0 to 2.5v Voltage input – 12b ADC
9	Ground	System common ground
10	Ground	System common ground
11	VSS	User device power – will be 1V less than Vuser
12	VSS	User device power – will be 1V less than Vuser
13	VSS	User device power – will be 1V less than Vuser
14	Density Frequency Input	5Vdc Pulse input

NOTES: 0-5V input is high impedance – use external voltage divider for higher voltages current inputs into 120 ohm load – can be 0 to 20 or 4-20 software configurable VSS is fused at 750 ma hold 1.4 ma trip user limited to 600 ma load

USB Connector plug (USB “A” Male)



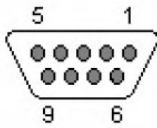
PIN	Name	Description
1	VBUS	USB voltage +5Vdc

2	D-	Data -
3	D+	Data +
4	GND	Ground

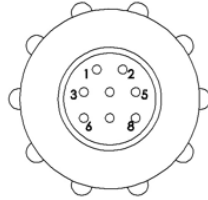
NOTE: USB requires a driver to be installed on the user's computer. To obtain a suitable driver for your system consult factory.

Flow Management Devices can also provide the appropriate driver and cable.

DB-9 Serial Communication - female

		
PIN	Name	Description
1	-	No connection
2	Txd	RS232 PDAQ transmit
3	Rxd	RS232 PDAQ receive
4	-	No connection
5	Ground	System common ground
6	-	No connection
7	-	No connection
8	-	No connection
9	-	No connection

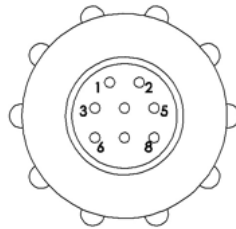
Turbine Meter A connector (AMP 206432-01 mates with 206434-1)



PIN	Name	Description
1	GND	Ground
2	Pulse	Turbine meter input (2.2k pull up resistor to VSS installed at factory)
3	VSS	User device power – will be 1V less than Vuser
4	GND	Ground
5	VSS	User device power – will be 1V less than Vuser

NOTE: Turbine meter input maybe pulse or open collector. If open collector use 5K to 10K pull up resistor to VSS. Any meter type (Coriolis, ultrasonic, Magnetic) is acceptable

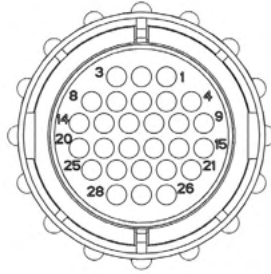
Turbine Meter B connector (AMP 206432-01 mates with 206434-1)



PIN	Name	Description
1	GND	Ground
2	Pulse	Turbine meter input (2.2k pull up resistor to VSS installed at factory)
3	VSS	User device power – will be 1V less than Vuser
4	GND	Ground
5	VSS	User device power – will be 1V less than Vuser

NOTE: Turbine meter input maybe pulse or open collector. If open collector use 5K to 10K pull up resistor to VSS. Any meter type (Coriolis, ultrasonic, Magnetic) is acceptable

28 PIN Control Connector (AMP 206038-1 mates to 206039-1)



PIN	Name	Description
1	VSS	User device power – will be 1V less than Vuser
2	-	No connection
3	-	No connection
4	VSS	User device power – will be 1V less than Vuser
5	VSS	User device power – will be 1V less than Vuser
6	VSS	User device power – will be 1V less than Vuser
7	-	No connection
8	-	No connection
9	Ground	System common ground
10	-	No connection
11	Ground	System common ground
12	Ground	System common ground
13	-	No connection
14	-	No connection
15	Ground	System common ground
16	-	No connection
17	Volume_Pulse	Start and Stop for prover volume (1k pull up resistor to VSS installed at factory)
18	Ready	Status of piston position. Used for Emerson/Brooks (1k pull up

		resistor to VSS installed at factory)
19	Prover Start "Launch"	Prover Start Pulse to Prover (4.75k pull up resistor to VSS via J16 jumper)
20	-	No connection
21	-	No connection
22	-	No connection
23	-	No connection
24	-	No connection
25	-	No connection
26	-	No connection
27	Leak	Not used in PDAQ
28	-	No connection

NOTES: Prover Start Pulse is open collector. If prover interface module has pull up then remove jumper on the 820229 PCB at J16 this adds a 4.75K resistor to VSS

3.0 INTERNAL PARAMETERS The following is a listing of the internal parameters. These may be accessed via Flow Management Devices software with Protocol (J-10 Ground, or open on this pin enables the Prove-It/CONDAT communication protocol. VSS on this pin will enable AFS protocol and full functionality described in following **Parameter List**. The **ID** column shows the communication address. When a parameter name is followed by in equal sign "=" the value to the right will be the initial default value.

ID	Variable	Size	Data type	Dimension	Unit	Note
0	SWDate[]= SW_DATE;	8	String	None	None	Software date of PDAQ (mm-dd-yy)
1	CA = 1;	1	Byte	None	None	Communication Address of PDAQ
2	Baud = 9600.0;	4	Float	None	None	Baud rate of PDAQ
3	SwVer[]= SW_VERSION;	14	String	None	None	SW version of PDAQ
4	UnitNumber;	1	Char	None	None	CA for PDAQ protocol (Communication address)
5	TxmSerial[];	6	String	None	None	PDAQ serial number
6	ResetPDAQ	1	Byte	None	None	Soft or Cold Start reset
7	LaunchProverPulse	4	Float	Timeout	ms	Pulse width of Prover Launch pulse
8	ControlPulseWidth=20;	2	uint	time	ms	Control pulses detected in this time frame will be ignored
10	MajorVersion	1	Byte	None	None	Major Version of PDAQ – reported to Prove-It
11	MinorVersion	1	Byte	None	None	Minor Version of PDAQ – reported to Prove-It
12	Port1Value	1	Byte	None	None	PDAQ Port1 Value – Reported to Prove-It
13	Port2Value	1	Byte	None	None	PDAQ Port2 Value – Reported to Prove-It

ID	Variable	Size	Data type	Dimension	Unit	Note
14	SatusValue	1	Byte	None	None	PDAQ Status – Reported to Prove-It
15	TimerA1	4	Float	Time	ms	Double Chronometry TimerA for channel#1
20	TimerB1;	4	Float	Time	ms	Double Chronometry TimerB for channel#1
21	Meter1PulseCount;	4	Float	None	None	Integer pulse count for meter 1
22	Meter1Frequency;	4	Float	Frequency	Hz	Meter 1 Fregeuncy
23	Meter1DCPulse;	4	Float	None	None	Double Chronometry Pulse count for meter 1
30	TimerB2;	4	Float	Time	ms	Double Chronometry TimerB for channel#2
31	Meter2PulseCount;	4	Float	None	None	Integer pulse count for meter 2
32	Meter2Frequency;	4	Float	Frequency	Hz	Meter 2 Fregeuncy
33	Meter2DCPulse;	4	Float	None	None	Double Chronometry Pulse count for meter 2
40	TimerB3;	4	Float	Time	ms	Double Chronometry TimerB for densitometer
41	DensitometerPulseCount;	4	Float	None	None	Integer pulse count for densitometer
42	DensitometerFrequency;	4	Float	Frequency	Hz	Densitimeter Fregeuncy
43	DensitometerDCPulse;	4	Float	None	None	Double Chronometry Pulse count for densitometer
50	Analog1;	4	Float	Current	A	Current#1 input
51	Analog2;	4	Float	Current	A	Current#2 input
52	Analog3;	4	Float	Current	A	Current#3 input
53	Analog4;	4	Float	Current	A	Current#4 input
54	Analog5;	4	Float	Current	A	Current#5 input
55	Analog6;	4	Float	Current	A	Current#6 input
56	Analog7;	4	Float	Voltage	V	Voltage#1 input
57	Analog8;	4	Float	Voltage	V	Voltage#2 input
60	CurrentRefMin	4	Float	Current	A	Current range minimum. Normally 20.0 mA
61	VoltageRefMax	4	Float	Voltage	V	Current range maximum. Normally 20.0 mA
62	VoltageRefMin	4	Float	Voltage	V	Voltage range minimum. Normally 0.0V
63	VoltageRefMax	4	Float	Voltage	V	Voltage range maximum Normally +2.5V
64	VoltageRef	4	Float	Voltage	V	Voltage internal reference Normally +2.500V
65	CurrentResistor	4	Float	Resistance	ohms	Actual value of the current load resistor Normally 120.0
140	PasswordLevel;	1	Byte	None	None	Actual password level
141	PassWords	8	Integer	None	None	Reference Passwords
142	P1	2	Integer	None	None	Password 1
143	P2	2	Integer	None	None	Password 2
144	P3	2	Integer	None	None	Password 3
145	P4	2	Integer	None	None	Password 4
150	InitializePDAQ	1	Byte	None	None	Stops Proving resets all variables, clears status and Ports
151	StartTimers	1	Byte	None	None	Starts PDAQ timers
152	StopTimers	1	Byte	None	None	Stops PDAQ timers
153	GetFullStatus	1	Byte	None	None	Gets full Prove-it/CONDAT Status
154	LaunchProver	1	Byte	None	None	Launch Prover
155	ReturnProver	1	Byte	None	None	Returns Prover

ID	Variable	Size	Data type	Dimension	Unit	Note
156	GetPDAQSerial	1	Byte	None	None	Gets full Prove-it/CONDAT Status
157	GetPDAQConfig	1	Byte	None	None	Gets full Prove-it/CONDAT PDAQ Configuration
158	GetPDAQPartialStatus	1	Byte	None	None	Gets full Prove-it/CONDAT PDAQ partial status
216	Time	8	String	None	None	Time of day
217	Date	8	String	None	None	Date

NOTE: Access to these items requires WINDSD9 software and VSS on J9-10. Otherwise, limited access via Prove-It software (see PDAQ Communication Manual Rev 1.doc)

The LED on the 820228 (CPU) board shows the state of the VOLUME PULSE from the prover. When this line is HIGH the LED is ON and when the line is low the LED is OFF