

PICOBOX

# Modbus DAQ

Modbus Data Acquisition Modules



High performance data acquisition modules for any HMI / SCADA solution

## Overview

The PICOBOX Modbus Data Acquisition (DAQ) is digital and analog I/O modules which are connected together on a RS485 network and is applicable for any HMI / SCADA solution. Communicating via the Modbus RTU protocol, PICOBOX DAQ is equipped with a 32-bit ARM CPU to provide high speed data processing and fast communication turn around times. Comes in 14 different module types to cater different I/O requirements, PICOBOX DAQ is a simple and cost-effective solution for any distributed I/O requirements in SCADA environment.

## How Modbus DAQ Works



## Features

- Portable device, DIN-rail mounting for easy installation
- Modbus connectivity
- Simple setup and easy handling on RS485 network
- Isolated modules available for special applications
- Low-cost IO modules for future expansion
- Works with MCONEX and other Modbus Master devices
- Easy module configuration and troubleshooting
- Data storage and close to real-time analysis on PC
- IO modules compatible with third party software via Modbus RTU Protocol
- Interface with field devices to provide real-time data for SCADA / PLC / HMI
- LEDs on every modules for digital IO status, communication and power supply
- Different types of IO Modules AI, AO, DI, DO, RTD, Thermocouples are available
- Direct reading of temperature without scaling by using RTD and Thermocouple Modules

## Applications

- Data Centre**  
(UPS, Air-con, Router, Server, Fire alarm panel, Generator, Water leakage detector, Security, Lighting, Power quality/distribution, Etc)
- Manufacturing Process**  
(Process error, PLC, Sensor, Machine status, Vision, Alarm signals, Vacuum, Electric transformer, Pressure valve, Gas tank, Over voltage, Etc)
- Telecommunication**  
(Power, Water leakage detector, Air-con, UPS, Etc)
- Fire and Security**  
(Door Sensor, Temperature, Smoke detector, Alarm panel, Annunciator)
- Facility Maintenance**  
(Lift, Elevator, Pump, ATS, Gen Set, Chiller, HVAC, HT/LT, Oil temperature, Oil pressure, Water level, Etc)
- Energy & Power Management**  
(Voltage Sag, Over voltage, Under voltage, Power outage, DC system)
- Environmental**  
(Temperature, Humidity, Co2, Wind speed, Water, Etc)
- HVAC**  
(Run, Trip, Fault, Etc)
- M & E Facility Management**  
(Tracking, Maintenance, Etc)
- Other mission critical applications**

# PICOBX Modbus DAQ Modules



## Digital Modules

**PB-16DI**



**PB-16DO**



**PB-4RO**



**PB-8DIO**



## Specifications

<b>Digital Inputs</b>	<b>16</b>	NA	NA	<b>8</b>
<b>No. of Counters</b>	16	NA	NA	8
<b>Counter Resolution</b>	32 Bit	NA	NA	32 Bit
<b>Counter Frequency</b>	1 KHz	NA	NA	1 KHz
<b>Counter Mode</b>	Up / Down	NA	NA	Up / Down
<b>Pulse Width</b>	Min 500 Micro Sec	NA	NA	Min. 500 Micro Sec
<b>Input Impedance</b>	2200 ohms	NA	NA	2200 ohms
<b>Isolation (Field &amp; Logic)</b>	1500 V RMS	NA	NA	1500 V RMS
<b>Status Indication</b>	LED for each channel	NA	NA	LED for each channel
<b>Digital Outputs</b>	<b>0</b>	<b>16</b>	<b>4</b>	<b>8</b>
<b>Type of Digital Output</b>	NA	Open Collector	Relay, Form C	Open Collector
<b>Maximum Load Current</b>	NA	100 mA/channel	0.5A / 1A each channel	100 mA/channel
<b>Maximum Load Voltage</b>	NA	36V DC	220V AC/28V DC	36V DC
<b>Isolation (Field &amp; Logic)</b>	NA	1500 V RMS	1000 V RMS	1500 V RMS
<b>Status Indication</b>	NA	LED for each channel	LED for each channel	LED for each channel
<b>Power Supply</b>	12-24V DC	12 - 24V DC	24V DC	12 - 24V DC

## Combination Module

### Specifications

<b>Analog Inputs</b>	<b>2</b>	0-20 mA/0-10V DC, Resolution: 12 bit, I/P Impedance: 250 ohms for current I/P, 190 K Ohms for Voltage I/P
<b>Analog Outputs</b>	<b>1</b>	0(4)-20 mA/0(2)-10V DC, Resolution: 12 bit, Drift: 100 PPM/DegC, Accuracy: 0.05% of span, Load: 1000 ohms@24V for current, 2000 Ohms for voltage output
<b>Digital Inputs</b>	<b>4</b>	Counter 32 bit, Frequency: 50Hz, Pulse width: 20ms, Voltage: 10-26V DC
<b>Digital Outputs</b>	<b>2</b>	Open collector, 36V DC (Max), 100mA/Output
<b>RTD Inputs</b>	<b>2</b>	Connection: 2/3 wire, Types: PT100/Ni120/PT1000, Resolution: 0.1 DegC, Isolation: 1500 V RMS
<b>Power Supply</b>		12-24V DC

**PB-DAIO**





# Analog Modules RTD and Thermocouple Inputs



## Specifications

Inputs	6, RTD Inputs	8, Thermocouple Inputs	8, Isolated Thermocouple Inputs
Type	PT100, Ni 120, PT1000, Ni1000-DIN, NI1000 Landys & Gyr 10-400 Ohms, 100-4000 Ohms	J,K,E,T,N,B,S,R,mV,C,D and G	J,K,E,T,N,B,S,R,mV, C, D and G
Connection	2/3 wire	2 wire	2 wire
Resolution	0.1 DegC	0.1 DegC	0.1 DegC
Sample Rate	31 samples/min	42 samples/min	37 samples/min
Drift	100 PPM/DegC	100 PPM/DegC	100 PPM/DegC
Isolation (Field & Logic)	1500 V RMS	1500 V RMS	1500 V RMS 350 V (P.P) between channels
Power Supply	12V to 24V DC	12V to 24V DC	12V to 24 V DC

## Current & Voltage Inputs



## Specifications

Analog Inputs	8	8	8	8
Type	Single-Ended	Single-Ended	Differential	Differential
Voltage	NA	0-10V DC / 0-5V DC	NA	0(2) - 10V / 0(1) - 5V DC
Current	0-20 mA	NA	0-20 mA	NA
Offset by Switch	4 mA	2V DC(0-10)/1V DC(0-5)	4 mA	2V DC (0-10)/ 1V DC (0-5)
Resolution	12 bit (0-4095)	12 bit (0-4095)	12 bit (0-4095)	12 bit (0-4095)
Sample Rate	12.5 Samples/sec	12.5 samples/sec	12.5 samples/sec	12.5 samples/sec
I/P Impedance	250 Ohms	20 K Ohms	250 Ohms	110 K Ohms
Isolation (Ch-Ch)	NA	NA	350 V (P.P)	350 V (P.P)
Drift	50 ppm/ DegC	50 ppm / DegC	100 ppm/DegC	100 ppm/DegC
Accuracy	0.2% of span	0.2% of span	0.2% of span	0.2% of span
Isolation (Field & Logic)	1500 V RMS	1500 V RMS	1000 V RMS	1500 V RMS
Power Supply	12V - 24V DC	12V - 24V DC	12V - 24V DC	12V - 24V DC

## Analog Outputs

### Specifications

#### PB-8AOI

#### PB-8AOV

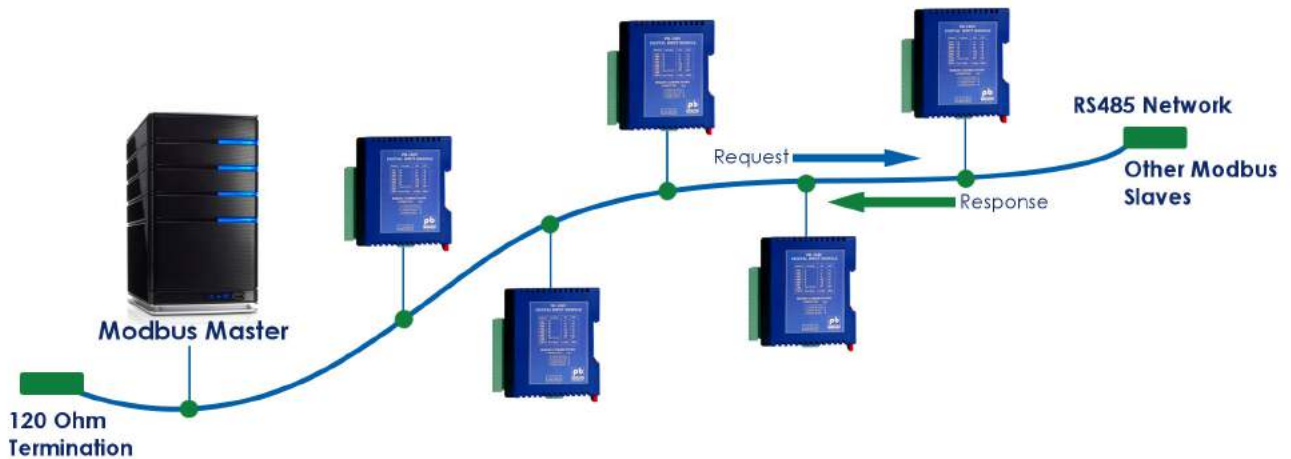
Analog Outputs	8	8
Voltage	NA	0-10V DC
Current	0-20 mA	NA
Offset	4 mA	2V DC
Resolution	12 bits (0-4095)	12 bits (0-4095)
Drift	100 ppm/DegC	100 ppm/DegC
Accuracy	0.05% of span	0.05% of span
Load	1000 Ohms @ 24V DC	2000 Ohms
Isolation (Field & Logic)	1500 V RMS	1500 V RMS
Power Supply	12V - 24V DC	12 - 24V DC

#### PB-8AOI

#### PB-8AOV



## Typical DAQ Setup



## Environmental & Physical

<b>Operating Temperature</b>	-10°C to + 50°C
<b>Storage Temperature</b>	-40°C to + 85°C
<b>Dimension (W x H x D)</b>	23 x 109 x 98mm
<b>Weight</b>	105 grams
<b>Mounting</b>	DIN Rail
<b>Power Supply</b>	12 - 24V DC
<b>Isolation (Field &amp; Logic)</b>	1500 V RMS

## Communication

<b>Interface</b>	2 Wire, RS485
<b>Modbus Address Setting</b>	By Dip Switch
<b>Modbus Max Address</b>	127 only
<b>Baud Rate</b>	2400, 4800, 9600, 19200 38400, 57600, 115200
<b>Parity</b>	None, Even, Odd
<b>Stop Bits</b>	1,2
<b>Data Bits</b>	8

## Model & Description

<b>PB-16DI</b>	16 Digital Input Module Including Counters
<b>PB-16DO</b>	16 Digital Output Module
<b>PB-4RO</b>	4 Relay Output Module
<b>PB-8DIO</b>	8 Digital Input & 8 Digital Output Module
<b>PB-8TC</b>	8 Thermocouple Input Module Incl. 0-50mV & ±100mV I/P
<b>PB-8TCS</b>	8 TC Input Module Incl. 0-50mV & ±100mV I/P Fully Isolated
<b>PB-6RTD</b>	6 RTD Input Module - PT100, Ni120, PT1000, Ni1000, Ni1000LG & Ohms
<b>PB-8AI</b>	8 Analog Input 0-20mA / 4-20mA
<b>PB-8AIV</b>	8 Analog Input 0-5V / 1-5V / 0-10V / 2-10V
<b>PB-8AIIS</b>	8 Analog Input 0-20mA / 4-20mA / ± 20mA Fully Isolated
<b>PB-8AIVS</b>	8 Analog Input 0-1V / 0-10V / ± 1V / ± 10V Fully Isolated
<b>PB-8AOI</b>	8 Analog Output Module 4-20mA
<b>PB-8AOV</b>	8 Analog Output Module 2-10V
<b>PB-DAIO</b>	2 RTD I/P, 2 Analog Input 4-20mA / 2-10V, 1 Analog Output 4-20mA / 2-10V, 4 Digital Input, 2 Digital Output