# PET-7H16M

Ethernet High-speed Data Acquisition Module

## Features

- 8 Single-ended Analog Input Channels (16-bit Resolution)
- Support real Sample and Hold
- Max Sample rate: 200 kS/s
- Built-in I/O
  - AI: 8 Channels
  - DI: 4 Channels
  - DO: 4 Channels

## Introduction

The PET-7H16M is a high speed data acquisition devices with a built-in Ethernet communication port for data transfer over a network, and includes 8 high-speed 16-bit single-ended Analog input channels (200 kHz sample and hold for all 8 channels), 4 Digital Input channels and 4 Digital Output channels. The module provides a programmable input range on all analog channels (±5 V and ±10 V), and the Digital Output can be set to output with short-circuit and overload protection. The PET-7H16M also provides 4 kV ESD protection as well as 2500 VDC intra-module isolation.

| | Software AD | External CLK AD | Pre-Trigger | Post-Trigger |
|---|---|---|---|---|
| **Continuous Mode** | 1 ~ 30 kHz | 1 ~ 30 kHz | - | - |
| **N Sample Mode** | 1 ~ 200 kHz | - | 1 ~ 200 kHz | 1 ~ 200 kHz |

## System Specifications

| **Communication** | |
|---|---|
| Ethernet Port | 1 x RJ-45, 10/100 Base-TX |
| PoE | Yes |
| Security | ID, Password and IP Filter |
| **LED Indicators** | |
| System Running | Yes |
| Ethernet Link/Act | Yes |
| PoE Power | Yes |
| **2-Way Isolation** | |
| Ethernet | 1500 VDC |
| I/O | 2500 VDC |
| **EMS Protection** | |
| ESD (IEC 61000-4-2) | 4 kV Contact for Each Terminal and 8 kV Air for Random Point |
| EFT (IEC 61000-4-4) | +/-4 kV for Power |

| **Power** | |
|---|---|
| Reverse Polarity Protection | Yes |
| Powered from Terminal Block | +12 ~ +48 VDC |
| Consumption | 2.6 W |
| **Mechanical** | |
| Dimensions (W x L x H) | 76 mm x 120 mm x 38 mm |
| Installation | DIN-Rail or Wall Mounting |
| Enclosures | Metal |
| **Environment** | |
| Operating Temperature | -25 ~ +75 °C |
| Storage Temperature | -30 ~ +80 °C |
| Humidity | 10 ~ 90 % RH, Non-condensing |

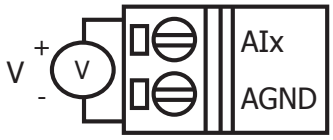
## I/O Specifications

| Analog Input | |
|---|---|
| Channels | 8 Single-ended |
| Resolution | 16-bit |
| Sampling Rate | 200 kS/s (Each Channel) |
| Bipolar Input (Programmable) | +/- 10 V, +/- 5 V |
| FIFO Size | 2 k Sample |
| Accuracy | 0.05 % of FSR<br>+/- 1 LSB @ 25 °C, +/- 10 V |
| AD Trigger Mode (Programmable) | Software/External Clock Trigger / Digital Trigger (Post/Pretrigger) |
| **Digital Iutput** | |
| Channels | 4 |
| Contact | Wet Contact |
| Sink/Source (NPN/PNP) | Sink/Source |
| On Voltage Level | +5 VDC ~ 30 VDC |
| Off Voltage Level | 1 VDC Max. |

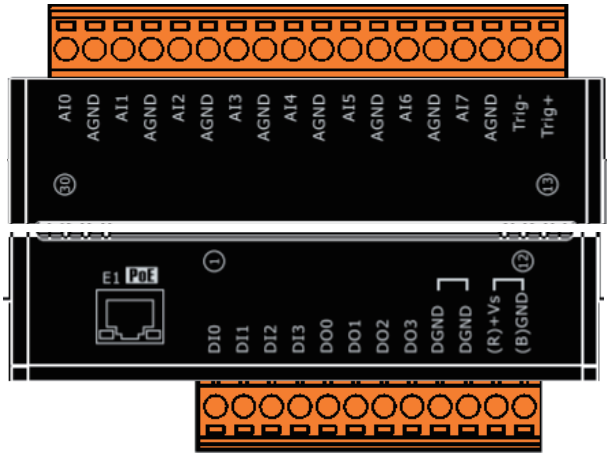
| Digital Output | |
|---|---|
| Channels | 4 |
| Type | Isolated Open Colllector |
| Sink/Source(NPN/PNP) | Sink |
| Load Voltage | +5 VDC ~ 30 VDC |
| Load Current | 100 mA |
| Short-circuit Protection | Yes |
| Overload Protection | 1.3 A |
| **External Clock Trigger / Digital Trigger** | |
| Trigger Pulse Width | 1.5 µs Min. |
| Trigger Type | Falling edge |
| On Voltage Level | +5 VDC ~ 5.5 VDC @ 15 mA |
| Off Voltage Level | < 0.8 VDC |

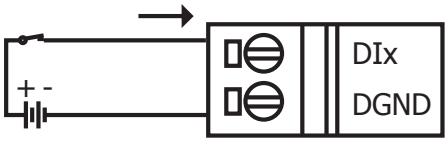
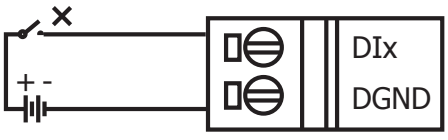
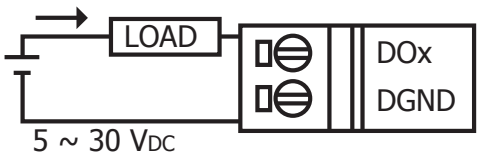
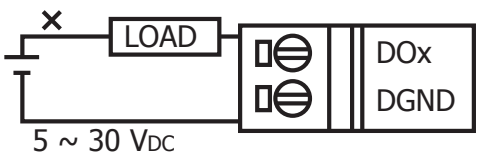
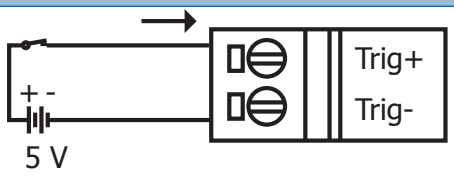
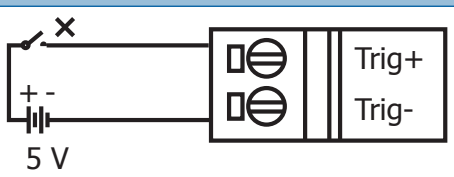
## Wire Connections

**Analog Input (Voltage)**




## Pin Assignments




| Digital Input/Counter | ON State<br>Readback as 1 | OFF State<br>Readback as 0 |
|---|---|---|
| Wet Contact (Sink) |  |  |
| **Digital Output** | **ON State<br>Readback as 1** | **OFF State<br>Readback as 0** |
| Open Collector (Sink) |  |  |
| **External Clock Trigger/ Digital Trigger** | **ON State<br>Readback as 1** | **OFF State<br>Readback as 0** |
| Open Collector (Sink) |  |  |

## Features

### ❶ Data transmission mode

1. Continuous transmission (Maximum sampling rate of 30 kHz per channel)

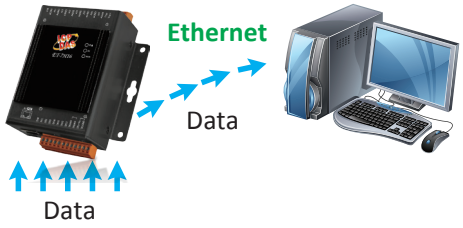
   After starting A/D acquisition, data is continuously transmitted to the Host PC.

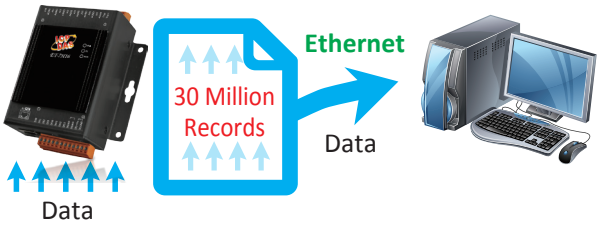
2. After collecting N data samples, the data is transferred to the Host PC (Maximum sampling rate of 200 kHz per channel)

   a. After starting A/D acquisition, the data will be temporarily stored in the memory on the PET-7H16M module, and wait until a command is received from the Host PC, before transferring the collected data to the Host PC.

   b. The memory capacity allows temporary storage of up to 30 million data samples, Storage time:

   i. 125 seconds at a sampling rate of 30 kHz.
   ii. 19.6 seconds at a sampling rate of 200 kHz.




### ❷ A/D trigger mode

1. Software AD Data Acquisition mode

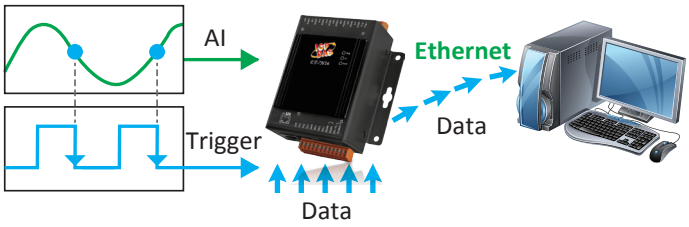
   The A/D acquisition parameters are configured via a command from the Host PC. The continuous A/D acquisition or the acquisition of N data samples begins after the command is triggered.

2. External Digital Signal Event Trigger mode

   The A/D acquisition parameters are configured via a command from the Host PC, and then triggered via an external electrical signal. The A/D acquisition of the N data samples is then started.

3. External Clock AD Conversion Data Acquisition mode

   The speed of the A/D acquisition and the amount of data acquired are controlled by external electrical signals. A falling edge for each output waveform triggers an AD conversion.




External Clock Signal Synchronization A/D Acquisition Mode

### ❸ External Digital Signal Event Trigger mode

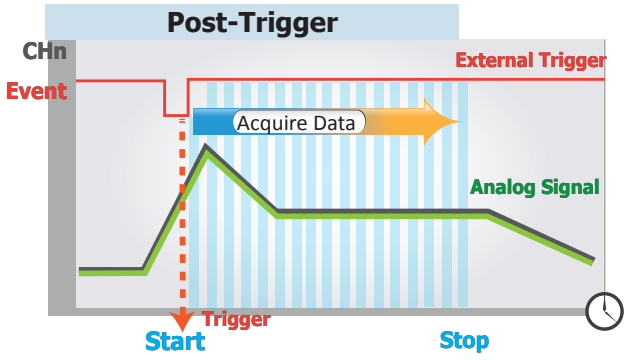
A/D acquisition is performed in external digital event trigger mode (triggering the electrical signal is the falling edge trigger). The maximum sampling rate per channel is 200 kHz, and A/D acquisition of N data samples is performed. The acquisition mode can be categorized into two types:

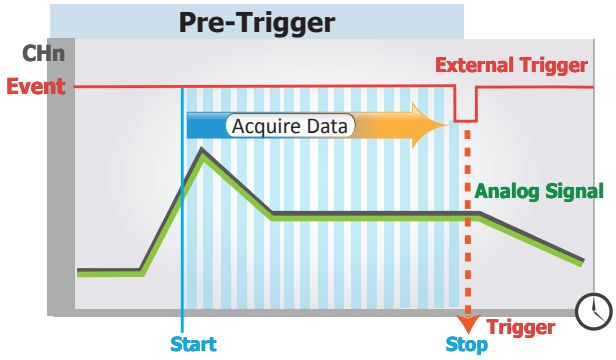
1. Pre-Trigger (acquisition of N data samples)

   The A/D data is continually collected and is temporarily stored in the memory on the PET-7H16M until the trigger signal is received. Once the trigger signal is received, the collected N data samples are then transferred to the Host PC.

2. Post-Trigger (acquisition of N data samples)

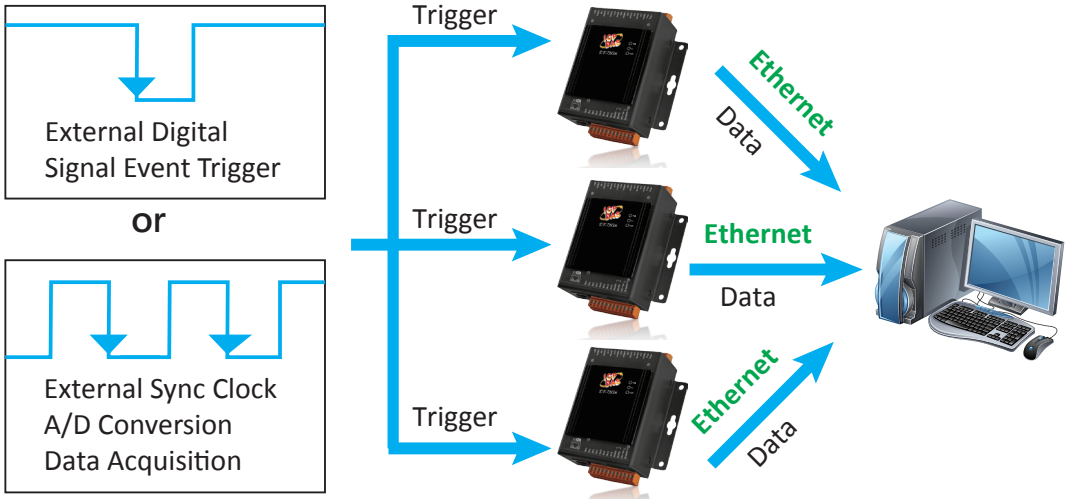
   In this mode, the A/D acquisition of the N data samples is started once the trigger signal is received.



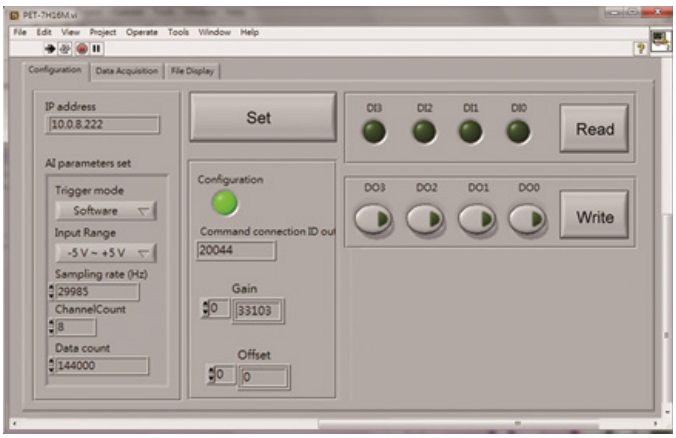

## ❹ A/D Synchronization Trigger Between Multiple Modules

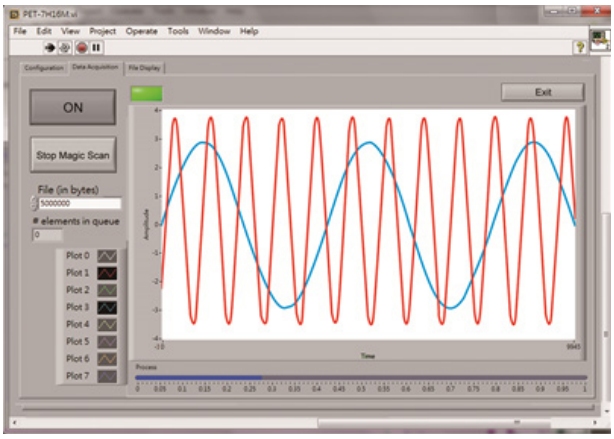
The A/D acquisition parameters are configured via a command from the Host PC, and are triggered by an external digital signal event, the A/D acquisition of N data samples, or A/D acquisition via the synchronization of an external clock signal.




## ❺ PC Software Support

1. VC, C#, VB.NET API and Demo
2. LabVIEW Toolkit and Demo




## Ordering Information

| | |
|---|---|
| **PET-7H16M** | Ethernet High Speed Data Acquisition Module with 8 x AI, 4 x DI, 4 x DO Channels (RoHS) |