

1. JY-9516T series Specifications

High-Performance Dynamic Signal Acquisition Module



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Overview

JY-9516T Series is a high-performance Dynamic Signal Acquisition (DSA) module for precision test and measurement. It delivers exceptional dynamic performance with SFDR up to 123 dBc, THD as low as -120 dBc and THD+N at -99 dBc, plus a 600 ppm high DC accuracy. Onboard oversampling boosts effective resolution and reduces system noise, paired with 24-bit synchronous acquisition and a 256 kS/s sampling rate. Offered in 8-channel (K) and 16-channel (P) versions, it has six voltage ranges and integrated antialiasing filters, with per-channel 4 mA IEPE excitation, IEEE 1451.4 TEDS support and multi-trigger modes. Ideal for industrial vibration testing, acoustic analysis, structural modal testing and precision sensor signal acquisition.

1.1 Main Features

- Spurious Free Dynamic Range (SFDR) : up to 123 dBc
- Total Harmonic Distortion (THD) : up to -120 dBc
- THD+N : -99 dBc
- Onboard Oversampling technology is enabled to enhance effective resolution and reduce system noise.
- DC Accuracy : 600 ppm
- ADC 24 bits resolution
- 16 channels (JY-9516T-P) / 8 channels (JY-9516T-K) simultaneous measurement
- Analog Input Configuration : Differential, Pseudodifferential
- Sampling rate 256 kS/s
- 6 Voltage Ranges : ± 0.3125 V, ± 0.625 V, ± 1.25 V, ± 2.5 V, ± 5 V, ± 10 V
- Antialiasing filters : Eliminate out-of-band interference
- Software-configurable AC/DC coupling per channel , 0.4 Hz cutoff frequency at AC couple
- 4 mA IEPE excitation for each channel
- TEDS Support (IEEE 1451.4 Class I TEDS)
- Analog/Digital/Software trigger and configuration

1.2 Analog Input Specifications

1.2.1 Analog Input

| | |
|------------------------|--|
| Number of channels | 16 (JY-9516T-P7/P5) / 8 (JY-9516T-K7/K5) |
| Input configuration | differential/Pseudodifferential |
| Input coupling | AC/DC (selectable per channel) |
| ADC resolution | 24 bits |
| ADC type | Delta-Sigma |
| Sample rate range | 62.5 S/s - 256 kS/s |
| Sample rate resolution | ≤ 0.0078125 S/s |
| Input range | $\pm 0.3125\text{V}/\pm 0.625\text{V}/\pm 1.25\text{V}/\pm 2.5\text{V}/\pm 5\text{V}/\pm 10\text{V}$ |
| IEPE Current | 4 mA (software selectable, per channel) |
| IEPE Compliance | 24 V |
| IEPE open | Software readable |
| IEPE short | Software readable |
| Onboard memory | 512MB |

Table 1 Input Characteristic

1.2.2 Input Signal Range

| Range (V) | Vrms (Sine Input) |
|--------------|-------------------|
| ± 0.3125 | 0.221 |
| ± 0.625 | 0.442 |
| ± 1.25 | 0.88 |
| ± 2.5 | 1.77 |
| ± 5 | 3.54 |
| ± 10 | 7.07 |

Table 2 Input Signal Range

1.2.3 Common-Mode Range

| Range (V) | Input | Configuration | |
|---|--------------------|------------------------|------------------------------|
| | | Differential (V peak)* | Pseudodifferential (V peak)* |
| $\pm 10, \pm 5, \pm 2.5, \pm 1.25, \pm 0.625, \pm 0.3125$ | Positive input (+) | ± 10 | ± 10 |
| | Negative input (-) | ± 10 | 7 Vrms |
| *Voltages with respect to ground | | | |

Table 3 Common-Mode Range

1.2.4 Analog Input Overvoltage Protection

| | |
|--|------------|
| Positive terminal | ± 28 V |
| Negative terminal (Pseudodifferential) | 7 Vrms |
| Negative terminal (Differential) | ± 28 V |

Table 4 Analog Input Overvoltage Protection

1.3 AI Accuracy

1.3.1 Analog Input DC Accuracy

| JY9516T Basic Accuracy = $\pm(\% \text{ Reading} + \% \text{ Range})$ | | | | | | | | | | | | |
|---|------------------------------------|---|------|------------------------------------|---|------|---|---|------|---------------------------|-----------------------------|-------------------------|
| Nominal Range (V) | 24 Hour Tcal $\pm 1^\circ\text{C}$ | | | 90 Days Tcal $\pm 5^\circ\text{C}$ | | | Temperature Coefficients ($^\circ\text{C}$) | | | 24 Hr Full Scale Accuracy | 90 Days Full Scale Accuracy | Full Scale Accuracy (%) |
| 0.3125 | 0.02 | + | 0.11 | 0.04 | + | 0.11 | 0.01 | + | 0.01 | 1 mV | 1 mV | 0.32 |
| 0.625 | 0.01 | + | 0.06 | 0.03 | + | 0.06 | 0.01 | + | 0.01 | 1 mV | 1 mV | 0.16 |
| 1.25 | 0.02 | + | 0.04 | 0.04 | + | 0.04 | 0.01 | + | 0.01 | 1 mV | 1 mV | 0.08 |
| 2.5 | 0.02 | + | 0.03 | 0.03 | + | 0.01 | 0.01 | + | 0.01 | 2 mV | 1 mV | 0.04 |
| 5 | 0.02 | + | 0.03 | 0.03 | + | 0.01 | 0.01 | + | 0.01 | 3 mV | 2 mV | 0.04 |
| 10 | 0.02 | + | 0.02 | 0.04 | + | 0.02 | 0.01 | + | 0.01 | 4 mV | 6 mV | 0.06 |

Table 5 Analog Input Accuracy

1.3.2 Analog Input AC Accuracy

Specifications valid at any attenuation setting with a 1 kHz output signal.

$$\pm 0.01\text{dB}$$

1.4 Input Amplifier Characteristics

1.4.1 Input Impedence

| Input Impedance | Configuration | |
|-----------------------------------|---------------|--------------------|
| | Differential | Pseudodifferential |
| Between positive input and ground | 10 M Ω | 10 M Ω |
| Between negative input and ground | 10 M Ω | 58 Ω |

Table 6 Input Impedence

1.4.2 Input Common-Mode Rejection Ratio (CMRR)

| Range (V) | Differential Configuration | |
|--------------|--|---|
| | DC-Coupled CMRR(dBc) $f_{in} \leq 1\text{kHz}$ | AC-Coupled CMRR(dBc) $f_{in}=50\text{ or }60\text{ Hz}$ |
| ± 0.3125 | 99 | 62 |
| ± 0.625 | 99 | 62 |
| ± 1.25 | 100 | 62 |
| ± 2.5 | 96 | 62 |
| ± 5 | 90 | 62 |
| ± 10 | 85 | 62 |

Table 7 Common-Mode Rejection Ratio (CMRR)

1.5 AI Dynamic Characteristics

1.5.1 AI Bandwidth and Alias Rejection

| | |
|--|--------------------|
| -3 dB Bandwidth (Normal) | $0.433 \cdot f_s$ |
| Aliasing Free Bandwidth (Normal) | $0.4 \cdot f_s$ |
| Aliasing Free Bandwidth (Wide Bandwidth) | $0.4535 \cdot f_s$ |

Table 8 AI Bandwidth and Alias Rejection

1.5.2 AI Filter Delay

| Normal Mode | |
|--------------------------|--------------------------------------|
| Sample Rate (kS/s) | Digital Filter Group Delay (samples) |
| $32 < f_s \leq 256$ | 38.00 |
| $4 < f_s \leq 32$ | 33.38 |
| $0.0625 \leq f_s \leq 4$ | 32.88 |
| Wide Bandwidth Mode | |
| Sample Rate (kS/s) | Digital Filter Group Delay (samples) |
| $32 < f_s \leq 128$ | 48.00 |
| $4 < f_s \leq 32$ | 33.38 |
| $0.0625 \leq f_s \leq 4$ | 32.88 |

Table 9 AI Filter Delay

1.5.3 AI Coupling

| | |
|--------------------------|--------|
| -3 dB cutoff frequency | 0.4 Hz |
| -0.1 dB cutoff frequency | 4.5 Hz |

Table 10 AI Coupling

1.5.4 AI Flatness

| Range (V) | DC-Coupled Flatness (dB)* | |
|--------------|---------------------------|-------------------|
| | 20 Hz to 20 kHz | 20 kHz to 100 kHz |
| ± 0.3125 | 0.006 | 0.05 |
| ± 0.625 | 0.006 | 0.05 |
| ± 1.25 | 0.006 | 0.05 |
| ± 2.5 | 0.006 | 0.05 |
| ± 5 | 0.006 | 0.05 |
| ± 10 | 0.007 | 0.08 |

Table 11 AI Flatness

1.5.5 AI Interchannel Phase Mismatch

| Range (V) | DC-Coupled Mismatch (deg) | | AC-Coupled Mismatch (deg) |
|--------------|---------------------------|-------------------|---------------------------|
| | 20 Hz to 20 kHz | 20 kHz to 100 kHz | 20 Hz |
| ± 0.3125 | <0.31 | <1.5 | <0.12 |
| ± 0.625 | <0.29 | <1.4 | <0.12 |
| ± 1.25 | <0.29 | <1.4 | <0.12 |
| ± 2.5 | <0.29 | <1.4 | <0.12 |
| ± 5 | <0.29 | <1.4 | <0.12 |
| ± 10 | <0.29 | <2.1 | <0.12 |

Table 12 AI Interchannel Phase Mismatch

1.5.6 AI Spectral Noise Density

| Range (V) | Noise Density at 1 kHz (nV/ $\sqrt{\text{Hz}}$) |
|--------------|--|
| ± 0.3125 | 19 |
| ± 0.625 | 21 |
| ± 1.25 | 26 |
| ± 2.5 | 40 |
| ± 5 | 73 |
| ± 10 | 142 |

Table 13 AI Spectral Noise Density

1.5.7 AI Dynamic Range

| Range (V) | Dynamic Range (dBFS) | |
|--------------|---------------------------|--------------------------|
| | $f_s = 51.2 \text{ kS/s}$ | $f_s = 256 \text{ kS/s}$ |
| ± 0.3125 | 98 | 91 |
| ± 0.625 | 103 | 96 |
| ± 1.25 | 107 | 100 |
| ± 2.5 | 109 | 102 |
| ± 5 | 110 | 103 |
| ± 10 | 111 | 103 |

Table 14 AI Dynamic Range

1.5.8 AI Spurious Free Dynamic Range (SFDR)

| | JY-9516T-K7 JY-9516T-P7 | JY-9516T-K5 JY-9516T-P5 |
|---|----------------------------|----------------------------|
| Range (V) | SFDR (dBc) | SFDR (dBc) |
| ± 0.3125 | 113 | 110 |
| ± 0.625 | 119 | 110 |
| ± 1.25 | 123 | 110 |
| ± 2.5 | 123 | 110 |
| ± 5 | 123 | 110 |
| ± 10 | 115 | 110 |
| fs = 256 kS/s 1 kHz input tone, input amplitude is the lesser of -1 dBFS. Measurement includes all harmonics. Unbalanced Source | | |

Table 15 AI Spurious Free Dynamic Range (SFDR)

1.5.9 AI Total Harmonic Distortion (THD), Balanced Source

| | JY9516T-K7, JY9516T-P7 | JY9516T-K5, JY9516T-P5 |
|--|---------------------------|---------------------------|
| Range (V) | THD (dBc) | THD (dBc) |
| ± 0.3125 | -111 | -108 |
| ± 0.625 | -116 | -108 |
| ± 1.25 | -120 | -108 |
| ± 2.5 | -120 | -108 |
| ± 5 | -120 | -108 |
| ± 10 | -113 | -108 |
| fs = 256 kS/s 1 kHz input tone, input amplitude is the lesser of -1 dBFS. Measurement includes all harmonics. Unbalanced Source | | |

Table 16 AI Total Harmonic Distortion (THD), Balanced Source

1.5.10 AI THD+N, Unbalanced Source

| | JY-9516T | |
|---|---------------------------|--------------------------|
| Range (V) | THD+N (dBc) | |
| | $f_s = 51.2 \text{ kS/s}$ | $f_s = 256 \text{ kS/s}$ |
| ± 0.3125 | -92 | -89 |
| ± 0.625 | -97 | -94 |
| ± 1.25 | -102 | -97 |
| ± 2.5 | -104 | -98 |
| ± 5 | -105 | -99 |
| ± 10 | -105 | -99 |
| 1 kHz input tone, input amplitude is the lesser of -1 dBFS . Measurement includes all harmonics. Unbalanced Source | | |

Table 17 AI THD+N, Unbalanced Source

1.5.11 AI Crosstalk (Input Channel Separation)

| Range (V) | Crosstalk for Adjacent Channels (dBc)* | |
|---|--|---------|
| | 1 kHz | 100 kHz |
| ± 0.3125 | -120 | -97 |
| ± 0.625 | -126 | -97 |
| ± 1.25 | -129 | -97 |
| ± 2.5 | -132 | -97 |
| ± 5 | -132 | -97 |
| ± 10 | -132 | -96 |
| Source impedance $\leq 50 \Omega$ Input amplitude is the lesser of -1 dBFS | | |

Table 18 AI Crosstalk (Input Channel Separation)

1.5.12 System Noise

JY-9516T System Noise (μVrms)

| System noise (μVrms) | | | | | | |
|-----------------------------------|-----------------------|----------------------|---------------------|--------------------|------------------|-------------------|
| Sample Rate (kS/s) | $\pm 0.3125\text{ V}$ | $\pm 0.625\text{ V}$ | $\pm 1.25\text{ V}$ | $\pm 2.5\text{ V}$ | $\pm 5\text{ V}$ | $\pm 10\text{ V}$ |
| 256 | 5.6 | 6.2 | 8.1 | 13.2 | 24.6 | 48.0 |
| 128 | 3.9 | 4.3 | 5.4 | 8.5 | 15.5 | 30.0 |
| 64 | 2.8 | 3.0 | 3.8 | 5.9 | 10.7 | 20.7 |
| 32 | 2.0 | 2.2 | 2.7 | 4.3 | 7.8 | 14.8 |
| 16 | 1.5 | 1.6 | 2.0 | 3.2 | 5.8 | 11.2 |
| 8 | 1.1 | 1.2 | 1.5 | 2.4 | 4.4 | 8.5 |
| 4 | 0.9 | 0.9 | 1.2 | 1.9 | 3.5 | 6.7 |
| 2 | 0.7 | 0.8 | 1.0 | 1.6 | 2.9 | 5.8 |
| 1 | 0.6 | 0.7 | 0.8 | 1.3 | 2.5 | 4.6 |

Table 19 System Noise (Down-sample from 256k at 2x decimation factor)

| System noise (μVrms) | | | | | | |
|-----------------------------------|-----------------------|----------------------|---------------------|--------------------|------------------|-------------------|
| Sample Rate (kS/s) | $\pm 0.3125\text{ V}$ | $\pm 0.625\text{ V}$ | $\pm 1.25\text{ V}$ | $\pm 2.5\text{ V}$ | $\pm 5\text{ V}$ | $\pm 10\text{ V}$ |
| 204.8 | 5.0 | 5.6 | 7.3 | 11.9 | 22.1 | 43.1 |
| 102.4 | 3.5 | 3.9 | 4.9 | 7.8 | 14.4 | 27.8 |
| 51.2 | 2.5 | 2.8 | 3.5 | 5.5 | 10.1 | 19.5 |
| 25.6 | 1.8 | 2.0 | 2.5 | 4.0 | 7.4 | 14.1 |
| 12.8 | 1.4 | 1.5 | 1.9 | 3.0 | 5.5 | 10.5 |
| 6.4 | 1.0 | 1.1 | 1.4 | 2.3 | 4.2 | 8.1 |
| 3.2 | 0.8 | 0.9 | 1.1 | 1.8 | 3.3 | 6.7 |
| 1.6 | 0.7 | 0.7 | 1.0 | 1.5 | 2.9 | 5.4 |
| 0.8 | 0.6 | 0.6 | 0.8 | 1.4 | 2.4 | 4.6 |

Table 20 System Noise (Down-sample from 204.8k at 2x decimation factor)

1.6 Integrated Electronic Piezoelectric (IEPE)

| | |
|-------------------------|---|
| Current 4 mA $\pm 10\%$ | each channel independently software selectable |
| Compliance | 32 V min Vcom + Vbias + Vfull-scale must be 0 to 32 V Vcommon-mode is the common-mode voltage seen by the input channel Vbias is the DC bias voltage of the sensor Vfull-scale is the AC full-scale voltage of the sensor |

Table 21 Integrated Electronic Piezoelectric (IEPE)

Note: The JY-9516T inputs must be set to pseudodifferential mode when IEPE is activated.

1.7 Transducer Electronic Data Sheet (TEDS)

Supports Transducer Electronic Data Sheet (TEDS) according to the IEEE 1451 Standard: Class I, all module inputs.

1.7.1 TEDS Specification

- Standard: IEEE 1451.4
- Class: Class I
- Detection: Automatic
- Configuration: Auto-load sensor parameters
- Supported transducers: IEPE accelerometers, microphones, etc.

1.8 Time Base

| | | |
|--|--------------|---|
| Internal reference clock | Accuracy | ± 1 ppm, over operating temperature range |
| | Aging | 1 ppm in first year |
| External reference clock (only PXIe-9516T) | Clock source | PXIe_CLK100 |
| | Frequency | 100 MHz |
| | Accuracy | Dependent on PXI backplane |

Table 22 time base

External time base: Equal to accuracy of external time base

1.9 Bus Interface

| | |
|-----------------------|---------|
| Bus support | PXIe |
| Synchronization(PXIe) | CLK_100 |

Table 23 Bus Interface

1.10 Power Requirements

Power Consumption (typical)

| Voltage (V) | Current (A) | Power (W) | Total Power (W) |
|-------------|-------------|-----------|-----------------|
| 12 | 1.4 | 16.8 | 17.4 |
| 3.3 | 0.18 | 0.6 | |

Table 24 Power Requirements

1.11 Triggers

| | | |
|-----------------|--|---|
| Trigger Modes | Start trigger, Reference trigger, Re-trigger for start trigger and reference trigger modes | |
| Trigger types | Immediate trigger, Software trigger, Analog trigger, and Digital trigger. | |
| Analog Trigger | Sources | JY9516T-P5/P7 : CH0 to CH15 JY9516T-K5/K7 : CH0 to CH7 |
| | Types | Edge, Hysteresis, Window |
| Digital Trigger | Sources | PFI0(Front panel) PXI Trigger Bus [0..7] |
| | Types | Rising edge, Falling edge |
| PFI0 | As an Input(Trigger): | |
| | Input type | SMB |
| | Compatibility | 3.3 V TTL, 5V tolerant |
| | impedance | 50 k Ω |
| | Input high threshold (VIH) | 2.0 V |
| | Input Low threshold (VIL) | 0.8 V |
| | Maximum input overload | -0.5 V ~ +5.5 V |
| | Trigger pulse width | 20 ns (minimum) |
| | As an Output (event): | |
| | impedance | 50 Ω |
| | Logic type | 3.3V TTL |
| | Maximum drive current | 24 mA |
| | Source | Start trigger , Reference trigger |

Table 25 Triggers

1.12 Physical

| | |
|------------|-----------------|
| Dimensions | Standard 3U PXI |
| Weight | 0.23 kg |

Table 26 Physical

1.13 Connector



Figure 1 PXI-9516T-K7/K5 Front Panel



Figure 2 PXI-9516T-P7/P5 Front Panel



| Signal | Con0 | Signal | Cable Marking | Function |
|--------|-----------|--------|---------------|-----------------------|
| GND | G1 | GND | | |
| AI7- | S2 S1 | AI7+ | CH7 | Analog Input channel7 |
| GND | G2 | GND | | |
| AI6- | S4 S3 | AI6+ | CH6 | Analog Input channel6 |
| GND | G3 | GND | | |
| AI5- | S6 S5 | AI5+ | CH5 | Analog Input channel5 |
| GND | G4 | GND | | |
| AI4- | S8 S7 | AI4+ | CH4 | Analog Input channel4 |
| GND | G5 | GND | | |
| AI3- | S10 S9 | AI3+ | CH3 | Analog Input channel3 |
| GND | G6 | GND | | |
| AI2- | S12 S11 | AI2+ | CH2 | Analog Input channel2 |
| GND | G7 | GND | | |
| AI1- | S14 S13 | AI1+ | CH1 | Analog Input channel1 |
| GND | G8 | GND | | |
| AI0- | S16 S15 | AI0+ | CH0 | Analog Input channel0 |
| GND | G9 | GND | | |

| Signal | Con1 | Signal | Cable Marking | Function |
|--------|-----------|--------|---------------|------------------------|
| GND | G1 | GND | | |
| AI15- | S2 S1 | AI15+ | CH15 | Analog Input channel15 |
| GND | G2 | GND | | |
| AI14- | S4 S3 | AI14+ | CH14 | Analog Input channel14 |
| GND | G3 | GND | | |
| AI13- | S6 S5 | AI13+ | CH13 | Analog Input channel13 |
| GND | G4 | GND | | |
| AI12- | S8 S7 | AI12+ | CH12 | Analog Input channel12 |
| GND | G5 | GND | | |
| AI11- | S10 S9 | AI11+ | CH11 | Analog Input channel11 |
| GND | G6 | GND | | |
| AI10- | S12 S11 | AI10+ | CH10 | Analog Input channel10 |
| GND | G7 | GND | | |
| AI9- | S14 S13 | AI9+ | CH9 | Analog Input channel9 |
| GND | G8 | GND | | |
| AI8- | S16 S15 | AI8+ | CH8 | Analog Input channel8 |
| GND | G9 | GND | | |

Figure 3 PXle-9516T Connector

1.14 Special Operating Restriction

The amplitude of the out-of-band signal between 0.3M and 3MHz must be less than 20% of full scale.¹

1. This restriction does not affect applications where PXIe-9516T is connected to the front-end sensors such as microphones and accelerators because these sensors have built-in attenuation so that the out-of-band voltage will not exceed 20% of full scale. If you have question on this restriction, please contact JYTEK for more information.

1.15 Optimizing Precision: Custom Gain Error Calibration for Fixed Sampling Rates

The gain error of the 9511 model varies with different sampling rates, and the specifications provided in this manual cover the error range across all potential sampling rates.

If users calibrate the gain error of their acquisition card for their specific sampling rate, they can achieve an accuracy that surpasses the general specifications that encompass all sampling rates.

2. Order Information

High-Performance Models

- PXIe-9516T-P7 (PN: JY2931514-01)
16-CH 24-Bit 256 kS/s PXIe High-Performance Dynamic Signal Acquisition Module
- PXIe-9516T-K7 (PN: JY2405561-01)
8-CH 24-Bit 256 kS/s PXIe High-Performance Dynamic Signal Acquisition Module

Standard Models

- PXIe-9516T-P5 (PN: JY5839705-01)
16-CH 24-Bit 256 kS/s PXIe Standard Dynamic Signal Acquisition Module (Replaces PXIe-9516)
- PXIe-9516T-K5 (PN: JY3732074-01)
8-CH 24-Bit 256 kS/s PXIe Standard Dynamic Signal Acquisition Module (Replaces PXIe-9515)

Accessory

- ACL-2000802-02 (PN: JY2000802-02)
20 cm, 8-CH shielded x4 InfiniBand to BNC cable

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4. Software

4.1 System Requirements

JY-9516T boards can be used in a Windows or a Linux operating system.

Microsoft Windows: Windows 7 32/64 bit, Windows 10 32/64 bit.

Linux Kernel Versions: There are many Linux versions. It is not possible JYTEK can support and test our devices under all different Linux versions. JYTEK will at the best support the following Linux versions.

| Linux Version | |
|---|--|
| Ubuntu LTS | |
| 16.04: | 4.4.0-21-generic(desktop/server) |
| 16.04.6: | 4.15.0-45-generic(desktop) 4.4.0-142-generic(server) |
| 18.04: | 4.15.0-20-generic(desktop) 4.15.0-91-generic(server) |
| 18.04.4: | 5.3.0-28-generic (desktop) 4.15.0-91-generic(server) |
| Localized Chinese Version | |
| 中标麒麟桌面操作系统软件（兆芯版）V7.0（Build61）: 3.10.0-862.9.1.nd7.zx.18.x86_64 | |
| 中标麒麟高级服务器操作系统软件V7.0U6: 3.10.0-957.el7.x86_64 | |

Table 27 Supported Linux Versions

4.2 System Software

When using the JY-9516T in the Window environment, you need to install the following software from Microsoft website:

Microsoft Visual Studio Version 2015 or above,

.NET Framework version is 4.0 or above.

.NET Framework is coming with Windows 10. For Windows 7, please check .NET Framework version and upgrade to 4.0 or later version.

Given the resources limitation, JYTEK only tested JY-9516T be with .NET Framework 4.0 with Microsoft Visual Studio 2015. JYTEK relies on Microsoft to maintain the compatibility for the newer versions.

4.3 C# Programming Language

All JYTEK default programming language is Microsoft C#. This is Microsoft recommended programming language in Microsoft Visual Studio and is particularly suitable for the test and measurement applications. C# is also a cross platform programming language.

4.4 JY-9516T Series Hardware Driver

After installing the required application development environment as described above, you need to install the JY-9516T hardware driver.

JYTEK hardware driver has two parts: the shared common driver kernel software (FirmDrive) and the specific hardware driver.

Common Driver Kernel Software (FirmDrive): FirmDrive is the JYTEK's kernel software for all hardware products of JYTEK instruments. You need to install the FirmDrive software before using any other JYTEK hardware products. FirmDrive only needs to be installed once. After that, you can install the specific hardware driver.

Specific Hardware Driver: Each JYTEK hardware has a C# specific hardware driver. This driver provides rich and easy-to-use C# interfaces for users to operate various JY-9516T function. JYTEK has standardized the ways which JYTEK and other vendor's DSA modules are used by providing a consistent user interface, using the methods, properties and enumerations in the object-oriented programming environment. Once you get yourself familiar with how one JYTEK DAQ card works, you should be able to know how to use all other DAQ hardware by using the same methods.

Note that this driver does not support cross-process, and if you are using more than one function, it is best to operate in one process.

4.5 Install the SeeSharpTools from JYTEK

To efficiently and effectively use JY-9516T boards, you need to install a set of free C# utilities, SeeSharpTools from JYTEK. The SeeSharpTools offers rich user interface functions you will find convenient in developing your applications. They are also needed to run the examples come with JY-9516T hardware. Please register and download the latest SeeSharpTools from our website, www.jytek.com.

4.6 Running C# Programs in Linux

Most C# written programs in Windows can be run by MonoDevelop development system in a Linux environment. You would develop your C# applications in Windows using Microsoft Visual Studio. Once it is done, run this application in the MonoDevelop environment. This is JYTEK recommended way to run your C# programs in a Linux environment.

If you want to use your own Linux development system other than MonoDevelop, you can do it by using our Linux driver. However, JYTEK does not have the capability to support the Linux applications. JYTEK completely relies upon Microsoft to maintain the cross-platform compatibility between Windows and Linux using MonoDevelop.

5. JYPEDIA

JYPEDIA is an excel file. It contains JYTEK product information, pricing, inventory information, drivers, software, technical support, knowledge base etc. You can register and download a [JYPEDIA](http://www.jytek.com) excel file from our web www.jytek.com. JYTEK highly recommends you use this file to obtain information from JYTEK.

6. Using JY-9516T in Other Software

6.1 Abbreviations

TEDS: Transducer Electronic Data Sheet

IEEE 1451.4: TEDS Standard

While JYTEK's default application platform is Visual Studio, the programming language is C#, we recognize there are other platforms that are either becoming very popular or have been widely used in the data acquisition applications. Among them are Python, C++ and LabVIEW. This chapter explains how you can use JY-9516T DSA module using one of this software.

6.2 Python

JYTEK provides and supports a native Python driver for JY-9516T boards. There are many different versions of Python. JYTEK has only tested in CPython version 3.5.4.

There is no guarantee that JYTEK python drivers will work correctly with other versions of Python.

If you want to be our partner to support different Python platforms, please contact us.

6.3 C++

We recommend our customers to use C# drivers because C# platform deliver much better efficiency and performance in most situations. We also provide C++ drivers and examples in the Qt IDE, which can be downloaded from web. However, due to the limit of our resources, we do not actively support C++ drivers. If you want to be our partner to support C++ drivers, please contact us.

6.4 LabVIEW

LabVIEW is a software product from National Instruments. JYTEK does not support LabVIEW and will no longer provide LabVIEW interface to JY-9516T boards. Our third-party partners may have LabVIEW support to JY-9516T boards. We can recommend you if you want to convert your LabVIEW applications to C# based applications.

7. Calibration

JYTEK JY-9516T series are pre-calibrated before the shipment. We recommend you recalibrate JY-9516T board periodically to ensure the measurement accuracy. A commonly accepted practice is one year. If you need to recalibrate your board, please contact JYTEK.

8. About JYTEK

8.1 JYTEK China

Founded in June, 2016, JYTEK China is a leading Chinese test & measurement company, providing complete software and hardware products for the test and measurement industry. The company has evolved from re-branding and reselling PXI(e) and DAQ products to a fully-fledged product company. The company offers complete lines of PXI, DAQ, USB products. More importantly, JYTEK has been promoting open-sourced based ecosystem and offers complete software products. Presently, JYTEK is focused on the Chinese market. Our Shanghai headquarters and production service center

have regular stocks to ensure timely supply; we also have R&D centers in Xi'an and Chongqing. We also have highly trained direct technical sales representatives in Shanghai, Beijing, Tianjin, Xi'an, Chengdu, Nanjing, Wuhan, Guangdong, Haerbin, and Changchun. We also have many partners who provide system level support in various cities.

8.2 JYTEK Software Platform

JYTEK has developed a complete software platform, SeeSharp Platform, for the test and measurement applications. We leverage the open sources communities to provide the software tools. Our platform software is also open sourced and is free, thus lowering the cost of tests for our customers. We are the only domestic vendor to offer complete commercial software and hardware tools.

8.3 JYTEK Warranty and Support Services

With our complete software and hardware products, JYTEK is able to provide technical and sales services to wide range of applications and customers. In most cases, our products are backed by a 1-year warranty. For technical consultation, pre-sale and after-sales support, please contact JYTEK of your country.

9. Statement

The hardware and software products described in this manual are provided by JYTEK China, or JYTEK in short.

This manual provides the product review, quick start, some driver interface explanation for JYTEK JY-9516T Series of dynamic signal analyzer modules. The manual is copyrighted by JYTEK.

No warranty is given as to any implied warranties, express or implied, including any purpose or non-infringement of intellectual property rights, unless such disclaimer is legally invalid. JYTEK is not responsible for any incidental or consequential damages related to performance or use of this manual. The information contained in this manual is subject to change without notice.

While we try to keep this manual up to date, there are factors beyond our control that may affect the accuracy of the manual. Please check the latest manual and product information from our website.

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