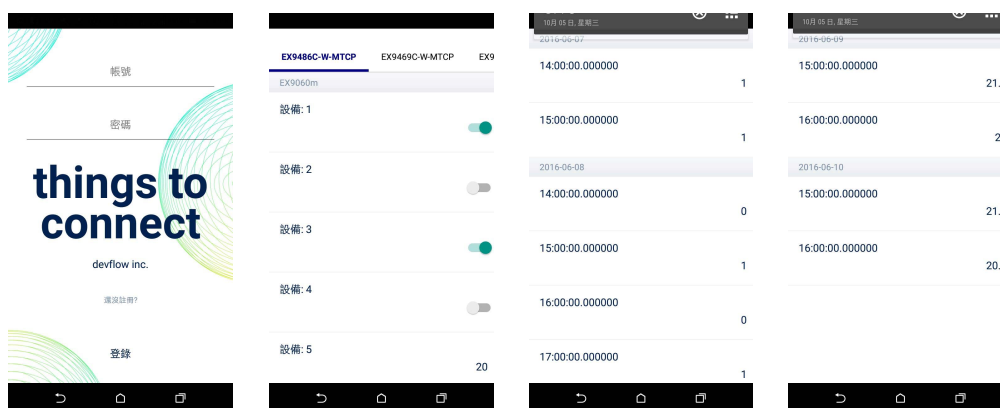


# Universal I/O Controller (I IOT App & Cloud solution)

## Intelligent Universal I/O Controller by App with Cloud (i OS/ Android)

User can easy to install the Remote I/O Controller in the Harsh environment .The Remote I/O Controller was one of engineering level devices. Now we make User easy to install & control by App with Cloud .



Application for sensor Thermocouple(J/K/T/E/R/S/B/N...(-270 ~ +1820 degree Celsius)) / Transmitter(+/- 4 ~ 20mA; +/- 500mV ~ +/- 1V) by App with Cloud control thru Wi-Fi & RS485 bus of EX9019-M(Individual Channel):



## Universal I/O Controller (I IOT App & Cloud solution)

### The Cloud System functions:

1. Member management
2. Enable user to register local routers, modules and channels to private cloud database
3. Observe and record status for registered channels in each 3 mins(default).
4. Support for K type Thermocouple sensor(default).
5. Allow to set logical conditions to monitor and trigger alarm when sensor data shows unusual.

### The App functions:

1. Read/ set the status of registered digital relay output.
2. Read the status of registered sensors from server
3. History record for each channels.

### The Step of App operation:

1. Download the App
2. Creat a Account



## Universal I/O Controller (I IOT App & Cloud solution)

### Hardware Specification:

**Certificate(optional) : ISPE's GAMP4(essential)、FDA's CFR 21 Part 11、domestic's cGMP、CE、 ROHS meet FCC Part 15.**

**Maximum monitoring devices: 10+**

**Temperature measurement range : -100 ~100 (change the probe to extend the temperature measurement range as -200~200 ).**

**Temperature accuracy :  $\pm 0.1\%$**

**Probe reaction time: Within 30 seconds Reaction at least 63% of temperature different.**

**Probe types: External thermocouple(K Type : default).**

**Probe length: At least 1.2 meters .**

**Number of probes: 1 ~ 8 probes can be connected.**

**Audible alarm: Sensor with buzzer alarm.**

**Alarm mute: The alarm mute button (optioal: automatically restart time).**

**Wireless transmission: Regularly detects temperature and sends the data back to the Server(Cloud).**

**Transmission mode: Through wireless (Wi-Fi) to transmit the refrigerator/devices temperature and conditions to the central monitoring system(Cloud).**

**Transmission range of Wireless : 100 meters (open area).**

**Data Capacity: 32,000 T values above .**

**Wired Downloads: From Cloud by PC(Web Page) .**

**Display: 1 x 2 inch"4 Digits LED.**

**Installation options: Stand-alone or wall-mounted (there are keyhole).**

**Power Input : DC24V, 1.87A or above.**



## Universal I/O Controller (I IOT App & Cloud solution)

### Software Specification:

**Software Language:** English .

**Personnel management:** It can set the account password to management .

**Eelectronic Approved(optional):** To prevent data tampering, data movement need to have the record by FDA CFR21 PART 11.

**Sensor settings:** It can set the time intervals of temperature record, alert type, high and low temperature threshold.

**Data information:** Data can be distinguished between normal and abnormal.

**Alert types:** Temperature anomalies, lack of electricity, the correction maturity & signal interruption.

**Software Alert:** Central monitoring system will pop up a warning with an alarm.

**Sound on Windows and send Email (required); SMS to the administrator for notify why.**

**Email Alert:** It can set multiple sets of accounts (> 4) to send and incidental cause of the alarm.

**Chart features:** Historical data and real-time data displays by Graphical and automatical corresponding to monitoring device.

**Create groups:** Simultaneously monitoring all devices and device groups.

**Historical data query:** It can query historical data by graphic and reading by listing.

**Report Output:** Need to report a variety of formats as PDF from Web Page(optional: Excel,Html will soon).

**Print function:** Historical data printing or instant printing.

**Data Backup:** Data Backup by automatic or manual (optional year / month / week / day).

**Data Acquisition:** A minimum sampling rate is 10 seconds and a maximum is 59 minutes.



## Universal I/O Controller

(I IOT App & Cloud solution)

**Remote monitoring:** Can be wireless LAN(Wi-Fi) by a **Web Page monitoring** the devices(optional: wired).

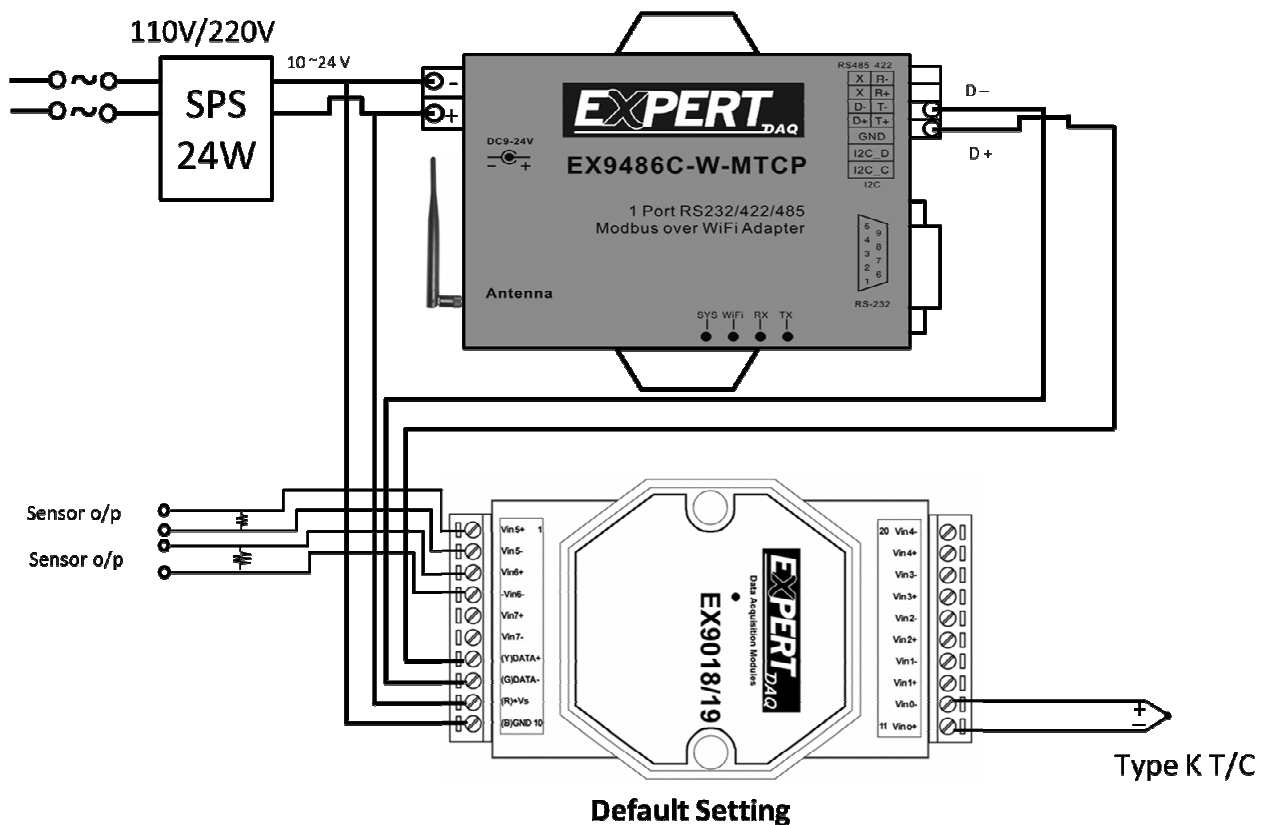
**Password protection:** Central monitoring system can set different levels of user password (local and remote).

**Temperature Calibration:** It included internal calibration features to ensure the temperature are correct.

**Operating System:** Windows 7 or Windows 10 (including the above).

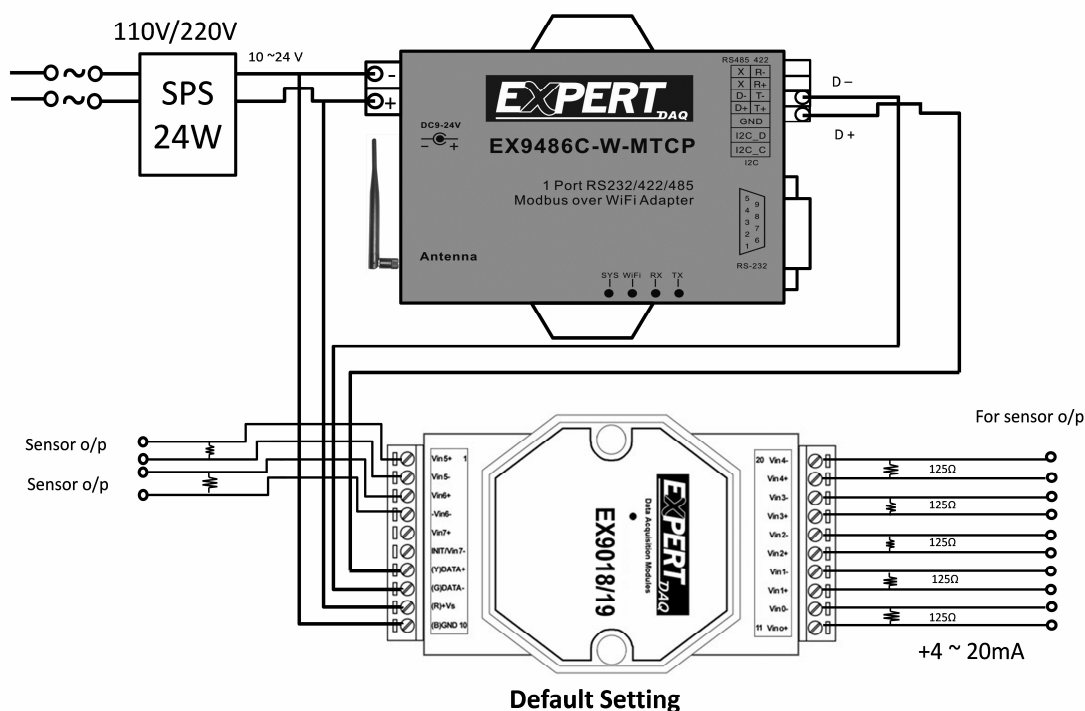
## Wire Connection of EX9019-M & EX9486CW-MTCP :

Drawing of Wire Connection for Thermocouple or Transmitter :



Wire connection example of  
Thermocouple(CH 0: K Type) & Transmitter(CH 5; 6: Current Type)  
Sensor

## Universal I/O Controller (I IOT App & Cloud solution)



Wire connection example of Transmitter Sensor (CH 0 ~ 6: Current Type)  
Fig. 1-1

### Note:

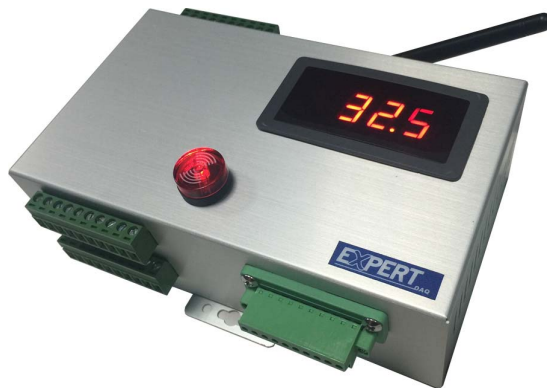
1. Default setting of EX9019-M: Baud Rate: 9600bps ; CheckSum: Non; 8, N , 1; Address: 1; Modbus Mode; Channel 0 ~7 Type: K ( -270 ~ +1372 degree Celsius).
2. Please refer the individual Manual of EX9019-M series for different channel Type setting : Thermocouple(K/T/E...) or Current (+/- 4~ 20mA) or Voltage(mV~V).
3. Default Setting of EX9486CW-MTCP: Router IP Setting & Cloud Server Setting ... that please refer Fig. 2-2; 3-3 ; 4-4



## Universal I/O Controller (I IOT App & Cloud solution)

### Wiring Recommendations:

1. It is recommended to  
use shielded wire and connect the shielding to the  
Execution current of channel.
2. For RS-485, use insulated and twisted pair 24 AWG wire, e.g.  
Belden 9841
3. Use 26-12 AWG wire for signal connections.



**Brush Finished Housing w/ Display & Flash Alarm & Expandable Connector**



## Universal I/O Controller (I IOT App & Cloud solution)

The Default Setting of EX9486CW-MTCP: Router IP Setting & Cloud Server Setting ... that please ref. Fig. 2-2; 3-3 ; 4-4;

The screenshot shows the 'Network' tab selected in the top navigation bar. Below it, the 'Wi-Fi' configuration section is visible. It includes a 'Network Type' dropdown set to 'Infrastructure', an 'SSID' field with a 'Scan' button and the value 'Gxi0306', an 'Auth Mode' dropdown set to 'WPA2-PSK', an 'Auth Password' field with the value 'stephy1222', and an 'Encrypt' dropdown set to 'AES'.

Choose Network -> change SSID and password for local wifi

**Fig.2-2**

The screenshot shows the 'Network' tab selected in the top navigation bar. Below it, the 'Network' configuration section is visible. It includes a 'Network Mode' dropdown set to 'Fixed Address', and several input fields: 'IP address' (192.168.1.100), 'Mask' (255.255.255.0), 'Gateway' (192.168.1.1), and 'DNS' (192.168.1.1).

Choose Network -> change IP address and mask and Gateway for local wifi

**Fig. 3-3**



## Universal I/O Controller (I IOT App & Cloud solution)

Modbus Gateway Log out  
ver : 1.0.11

System Network **GateWay**

**Gateway**

Mode : TCP Client to RTU Slave

Message Timeouts(ms) : 500

**TCP SERVER PROPERTIES**

Destination IP : 218.161.2.177

Destination Port : 12345

Choose Gateway -> change mode to **TCP Client to RTU slave** -> change Destination IP to **218.161.2.177** and port to **12345**

Fig. 4-4



## Universal I/O Controller (I IOT App & Cloud solution)

### Relative Information:

Wire Connection of EX9019-M & EX9486C-W-MTCP refer the Quick Manual of Universal I/O Controller .

**Default setting of EX9019-M:** Baud Rate: 9600bps ; CheckSum: Non; 8, N , 1; Address: 1; Modbus Mode; Channel 0~7 Type: K

**Note:** Please refer the individual Manual of EX9019-M series for different channel Type setting : Thermocouple(K/T/E...) or Current (+/- 4~ 20mA) or Voltage(mV~V).

**Default Setting of EX9486-MTCP:** Router IP Setting & Cloud Server Setting ... refer Manual of EX9486CW-MTCP

**Sensor Spec. & Type:** K/T/E/R.. type Thermocouple between -270 ~ +1820 degree Celsius all was Thermocouple Measure for Input of EX9019-M.

**Sensor Spec. & Type:** Liquid/ Gas/ Small Flow Meter/ Gas Detector or Infrared Temp. / Level Transmitter/ Level Sensor/ Pressure Transmitter/ Pressure Switch/ Differential Pressure Transmitter/Temperature/ Humidity /Pyrano meter/ UV Detector all was 4~20mA output by RS485 bus to Input of EX9019-M. (Also it can set to Type: mV ~ V for different application).

Also refer the Manual of Universal I/O Controller for Sensor Spec. & Type

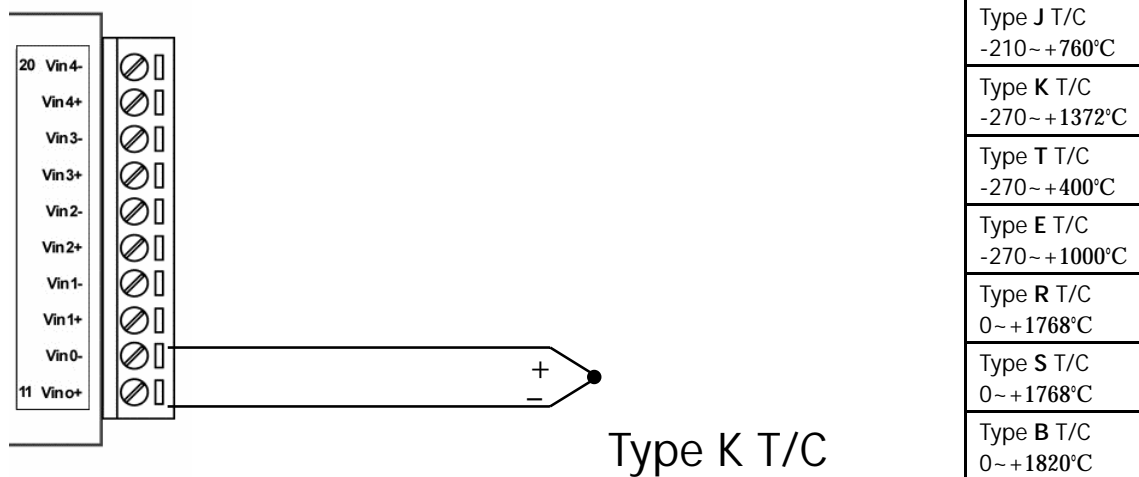
## Universal I/O Controller

(I IOT App & Cloud solution)

Wire Connection of Thermocouple:

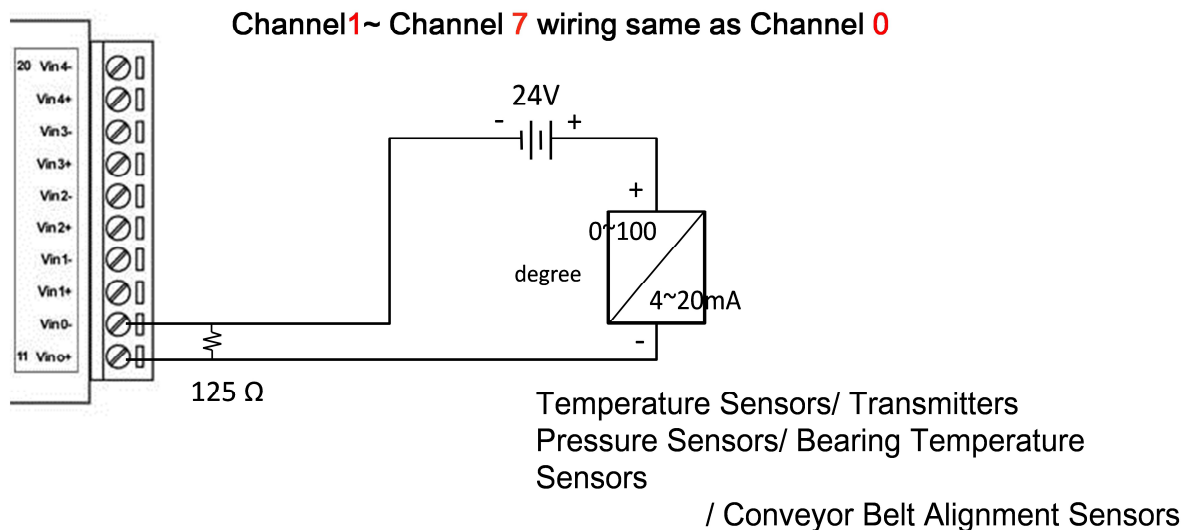
EX9019-M

**Channel 1 ~ Channel 7 wiring same as Channel 0**



Wire Connection of Transmitter:

EX9018/19-M





## Universal I/O Controller (I IOT App & Cloud solution)

### Reference of some Sensors:

#### Thermocouple sensor with Cement-On Surface

- Styles 1 and 2 are made from 0.0005" thermocouple alloy foil by a special process where the butt welded thermocouple junction is 0.0005" in thickness. Styles 1 and 2 are flat, extremely low inertia construction and are an ideal means of measuring the temperature of both flat and curved metals, plastic and ceramic surfaces where very fast response is desired.

Style 1 and 2 thermocouples are fabricated from ANSI "Special Limits of Error" grade thermocouple materials in "K", "E" and "T" calibrations and yield accurate temperature indication when used with standard thermocouple instrumentation. Styles 1 and 2 have the fastest response. Style 3 is an economy version constructed from 0.010" diameter bead welded standard limit of error thermocouple wire. It should be used where extremely fast response is not essential. Response Time in Milliseconds.

- Made from 0.0005" Foil and 0.010" Diameter Thermocouple Wire
- Very Low Thermal Inertia
- Four Calibrations "K", "E", "J" and "T"
- Lead lengths: Style 1 and 3 are 1m (40") long. Style 2 is 150mm (6") long, standard. Additional lengths are available on request.



## Universal I/O Controller

(I IOT App & Cloud solution)



### Pressure sensor with internal diaphragm

Accuracy 0, 35% resp. 0, 5%  
For lower pressure

For the measuring of very low gauge pressure from 10 mbar  
and vacuum (-1...0 bar).

Suitable for gases, pressure and thin liquid, not aggressive oils.

Output signal 4...20mA - 2-wire system



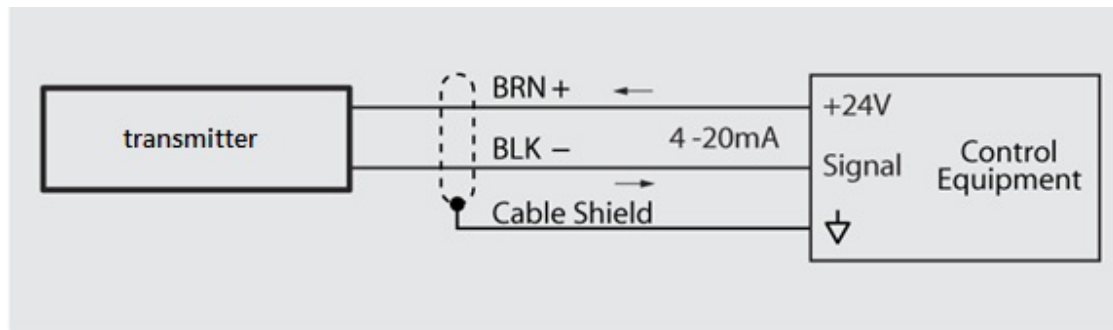
## Universal I/O Controller (I IOT App & Cloud solution)

### Temperature Sensor/Transmitters for Class II and III hazardous locations

All models are compatible with standard 2-wire 4-20mA current loops and analog inputs and are identical with the exception of the measurement probes and fittings.

The measurement probe and fittings options are optimized for grain handling facility shaft

Wiring diagram (typical installation)

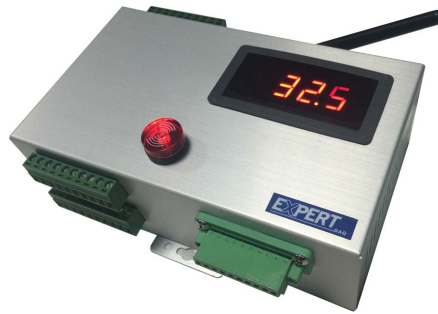


### Temperature Sensor/Transmitters



## Universal I/O Controller

(I IOT App & Cloud solution)



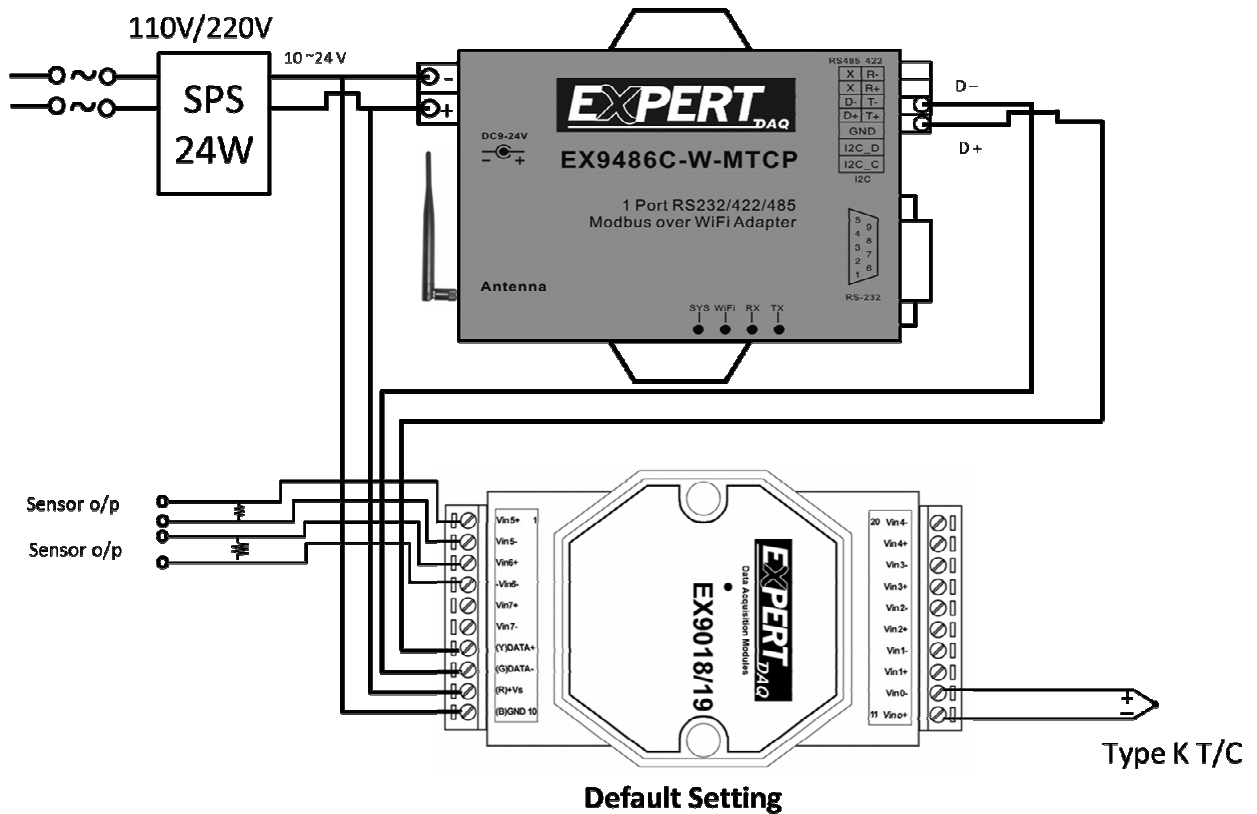
**Brush Finished Housing w/ Display & Flash Alarm & Expandable Connector**



## Universal I/O Controller (I IOT App & Cloud solution)

### Appendix A : User don't use the App func.

### Wire Connection & Pin Assignment of normal func.:



(EX9019-M+ EX9486CW-MTCP)

Fig. 5-5.

1. User can stand alone or configure it by yourself for different Applications as K/T/E/R... Thermocouple between -270 ~ +1820 degree Celsius Analog signal for different Sensors as individual Manual of EX9019-M
2. The module of EX9019-M can be set as Modbus or ASCII mode by Command sets and Utility of EX9000/EX9000-M to set different parameters.



## Universal I/O Controller (I IOT App & Cloud solution)

Note:

1. When you change App function to normal function that you must record/ memo the Setting of EX9486CW-MTCP & EX9019-M for you want change back to App functions.
2. Please refer to the individual Manual of EX9019-M and EX9486CW-MTCP(IP Setting of Router(LAN) & (WAN)) if you don't use the App functions .

### Appendix B:

#### Functions Expandable of App (Universal I/O Controller):

Users bought the Universal I/O Controller for Thermocouple(J/K/T/E/R/S/B/N/C(-270 ~ +1820 degree Celsius)) / Transmitter(+/-4~20mA; +/-500mV~+/-1V) sensor to measurement in first step. After some time User hope to expandable the functions of this Universal I/O Controller to output control the Harsh enviornment.

Users can select EX9060D-M to output control the Alam warning or turn-off the Switch/ Valve/ Breaker for Safty situation during the Sensors sense value Higher/ Lower the setting value.

Also, EX9019-M have 8 channels for Input value by Sensors that's mean EX9060D-M can output control 4\* Alam or turn-off the Switch/ Valve/ Breaker for safety situation during the Sensors sense value Higher/ Lower the setting value.

Note:

1. The App of Universal I/O Controller will bundle the App w/ Output Control functions of EX9060D-M for User's Expandable requirement when Users buy EX9060D-M .



## Universal I/O Controller (I IOT App & Cloud solution)

### Wire Connection & Pin Assignment of functions

Expandable :

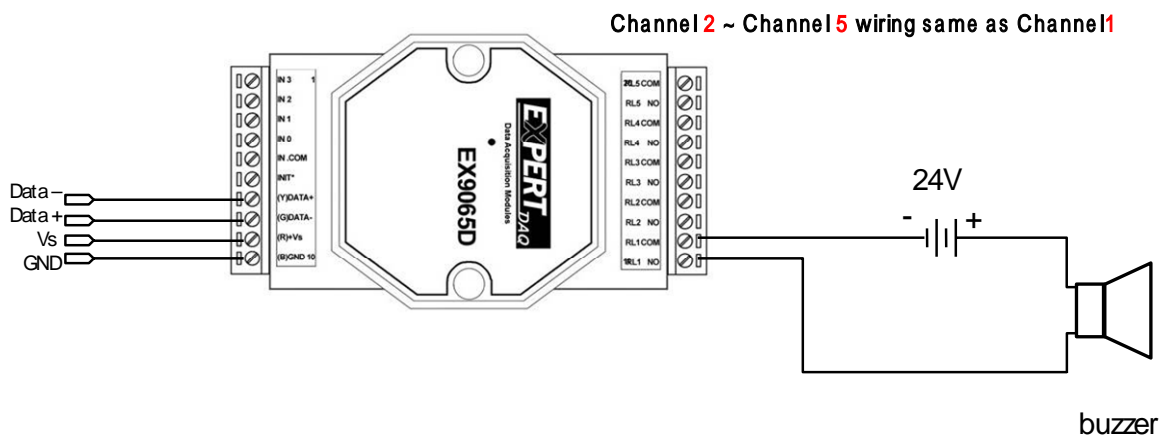


Fig. 6-6

(EX9019-M + EX9486CW-MTCP + EX9060D-M)



Brush Finished Housing w/ Display & Flash Alarm & Expandable Connector



## Universal I/O Controller (I IOT App & Cloud solution)

### The Expandable functions of App:

1. Read/ set the status of registered digital relay output.

(EX9018M Input Channel 1~4 for EX9060D-M Output Channel 1~4)

(EX9018M Input Channel 5~8 for new one of EX9060D-M Output Channel 1~4 to expandable)

2. Read the status of registered sensors from server.

(EX9018M Input Channel 1~8)

3. History record for each channels.

(EX9018M Input Channel 1~8)

Note :

1. User should be download the App of Expandable Functions for Expandable and the steps & operations same as above mentions

2. User can select the Module name for Expandable after you download the App with Expandable func.

3. User can select different Remote I/O Modules of EX9000-M to expandable the applications by Cloud System with

<http://topsgcc.com.tw> ; <http://DevDAQ.com.tw>