ICP DAS

Quad-band Automation Controller

Features

- Built-in Web Server for IF-THEN-ELSE rule setting
- Built-in IF-THEN-ELSE rule enigne for logic operation
- No more programming. Just click and get done!
- Support IO, Counter, Timer, Email operations
- Modbus/TCP Protocol for SCADA Software Seamless Integration
- IEEE 802.3af-compliant Power over Ethernet (PoE)
- 10/100 Base-TX Ethernet
- Support GPRS/GSM: Quad-band 850/900/1800/1900 MHz
- I/O: 3 channels DI, 3 channels DO, 8 channels AI
- Support SD storage card
- 128*64 dots LCM display (only for WISE-4000D)

WISE-4000/WISE-4000D

3-channel Digital Input, 3-channel Digital Output, and 8-channel Analog Input GPRS Module

Introduction

WISE (Web Inside, Smart Engine) is a product series developed by ICP DAS that functions as control units for use in remote logic control and monitoring in various industrial applications. WISE offers a user-friendly and intuitive web site interface that allows users to implement IF-THEN-ELSE control logic on controllers just a few clicks away; no programming is required. With its powerful and easy-to-use features, it will minimize the learning curve, shorten time to market and dramatically reduce the effort and cost spent on system development.

The WISE-4000 is a M2M (Machine to Machine) embedded controller equips with a cellular transceiver that enables integrated monitoring of industrial equipments or environments and allows updated status information being sent to the backend monitoring system. WISE-4000 supports Modbus/TCP protocol that allows seamless integration with SCADA software available. It features 3 digital inputs, 3 digital outputs and 8 analog inputs. WISE-4000 also features GPRS/GSM & Ethernet that provide a highly-flexible solution for transferring monitoring data by GPRS, SMS or Ethernet interface. Integrate with IF-THEN-ELSE rule engine, WISE-4000 even provides more powerful functions such as Schedule · Send SMS · Send e-mail · Timer & I/O operation for use in various industrial applications.

Applications

Building Automation, Factory Automation, Machine Automation, Remote Maintenance, Remote diagnosis and Testing Equipment, etc.

I/O Specifications

Digital Input		
Input Channels		3
Input Type		Source(Dry Type), Common Ground
On Voltage Level		+3.5 $V_{DC} \sim$ +30 V_{DC}
Off Voltage Level		+1 V_{DC} Max.
Isolated Voltage		Non-isolated
Counters	Max. Count	65535 (16 bits)
	Max. Input Frequency	50 Hz
	Min. Pulse Width	10 ms

Digital Output		
Output Channels		3
Output Type		Open Collector (Sink/NPN)
Load Voltage		+30 V_{DC} Max.
Load Current		100 mA Max.
Isolated Voltage		Non-isolated
Counters	Max. Count	65535 (16 bits)
	Max. Input Frequency	50 Hz
	Min. Pulse Width	10 ms

Analog Input	
Input Channels	8
Input Range/Type	0~20 mA
Resolution	12-bit
Sampling Rate	1 KHz max. (Read one channel)

System Specifications

Item		WISE-4000	WISE-4000D
CPU		80 MHz internal microprocessor	
SRAM/Flash		512K/512K, real time clock, watchdog timer	
NVRAM		31 bytes, battery backup, data valid up to 10 years	
EEPROM		16 KB	
Communication Interface			
COM ports		COM1:5-wire RS-232; COM2: RS-485; COM3:3-wire RS-232	
Ethernet		10/100 Base-TX Ethernet controller	
GPRS Interface			
Frequency Band		Quad-band 850/900/1800/1900 MHz	
GPRS connectivity		GPRS class 10/8; GPRS station class B	
DATA GPRS		Downlink transfer: Max. 85.6 kbps; Uplink transfer: Max 42.8kbps	
SMS		MT, MO, CB, Text and PDU mode	
LCD Interface			
General	Effective display area	-	80.61 mm x 14.37 mm (W x H)
	Module Dimension	-	93 mm x 70 mm x 1.6 mm (W x H x T)
Life Time		-	Expected life is more than 100,000 hours under normal operation
Power			
Protection		Power reverse polarity protection	
Frame Ground Protection		ESD, Surge, EFT, Hi-Pot	
Power Requirement		15W; Unregulated +10 $V_{DC} \sim$ +30 V_{DC}	
Power Consumption		Idle: 75 mA @ 24 V_{DC}; Data Link: 150 ~ 400 mA (peak) @ 24 V_{DC}	
LED Indicators			
System		Red	
GPRS		Yellow	
Mechanical			
Dimensions		72 mm x 123 mm x 35 mm (W x H x D)	
Installation		DIN-Rail or Wall mounting	
Environment			
Operating Temperature		-20 °C ~ +70 °C	-15 °C ~ +55 °C
Storage Temperature		-40 °C ~ +80 °C	-20 °C ~ +70 °C
Humidity		5~90% RH, non-condensing	

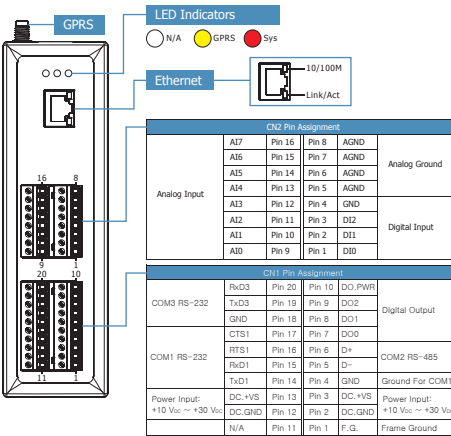## Software Specifications

Functions	
36 IF-THEN-ELSE Logic Rules	3 IF conditions with AND or OR operators 3 THEN actions 3 ELSE actions
48 Internal Registers	Hold temporary variables and read/write data via Modbus/TCP address.
12 Timers	Delay / Timing functions.
12 Schedules	Setup prescheduled routine tasks.
12 Emails	Send Email messages to pre-set Email receivers.
12 SMS	Send SMS to pre-set mobile phone numbers.
Rule Configuration Website	Access Web server on WISE controllers to edit and upload logic rules through web browser.
Modbus/TCP Protocol	Real time control and monitoring I/O channels and system status of controllers via SCADA software.

IF Conditions	
DI Channel	ON、OFF、ON to OFF、OFF to ON、Change
AI Channel	=、>、<、>=、<=(value)
Internal Register	
DI Counter	=、>、<、>=、<=(value)、Change
DO Counter	
Timer	Timeout、Not Timeout
Schedule	In Range、Out Range

WISE
IF-THEN-ELSE
Rule Engine
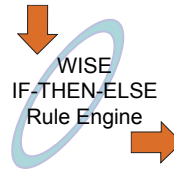
THEN / ELSE Actions	
DO Channel	ON、OFF、Pulse Output
Internal Register	Change the value
DI Counter	Reset
DO Counter	
Timer	Start、Stop
Schedule	
Email	Send
SMS	

Pin Assignment

GPRS

LED Indicators
N/A   GPRS   Sys

Ethernet

10/100M
Link/Act

CN2 Pin Assignment				
Analog Input	AI7	Pin 16	Pin 8	AGND	Analog Ground
	AI6	Pin 15	Pin 7	AGND	
	AI5	Pin 14	Pin 6	AGND	
	AI4	Pin 13	Pin 5	AGND	
	AI3	Pin 12	Pin 4	GND	Digital Input
	AI2	Pin 11	Pin 3	DI2	
	AI1	Pin 10	Pin 2	DI1	
	AI0	Pin 9	Pin 1	DI0	

CN1 Pin Assignment				
COM3 RS-232	RxD3	Pin 20	Pin 10	DO.PWR	Digital Output
	TxD3	Pin 19	Pin 9	DO2	
	GND	Pin 18	Pin 8	DO1	
COM1 RS-232	CTS1	Pin 17	Pin 7	DO0	
	RTS1	Pin 16	Pin 6	D+	COM2 RS-485
	RxD1	Pin 15	Pin 5	D−	
	TxD1	Pin 14	Pin 4	GND	Ground For COM1
Power Input: +10 Vᴅᴄ ~ +30 Vᴅᴄ	DC.+VS	Pin 13	Pin 3	DC.+VS	Power Input: +10 Vᴅᴄ ~ +30 Vᴅᴄ
	DC.GND	Pin 12	Pin 2	DC.GND	
	N/A	Pin 11	Pin 1	F.G.	Frame Ground

Wire Connection

Digital Input Wire Connection

Input Type	DI Value as 0	DI Value as 1
Relay Contact	Relay On	Relay Off
	Relay Close — DIx / GND	Relay Open — DIx / GND
TTL/CMOS Logic	Voltage < 1V	Voltage < 3.5V
	Logic Level Low / Logic GND — DIx / GND	Logic Level High / Logic GND — DIx / GND
Open Collector	Open Collector On	Open Collector Off
	On — DIx / GND	Off — DIx / GND
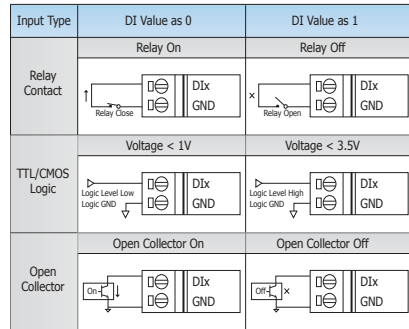
Digital Output Wire Connection

Output Type	DO Command as 0	DO Command as 1
Drive Relay	Relay ON	Relay Off
	DO.PWR / DOx / DO.GND	DO.PWR / DOx / DO.GND
Resistance Load	DO.PWR / DOx / DO.GND	DO.PWR / DOx / DO.GND
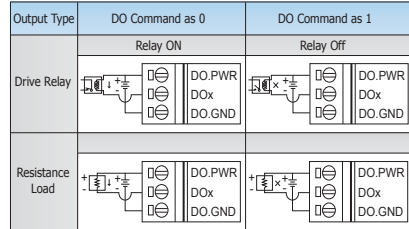
Current Input Wire Connection

Input Type	
	mV/V — AIx / AGND

Dimensions (Unit: mm)

Right Side View

LCD

WISE-4000

WISE-4000D

RUN
Lock
INIT
DIP switch

SIM Card
GPRS
MMC/SD

Top View

Front View

142
128.1
47.0
168.0
158.7
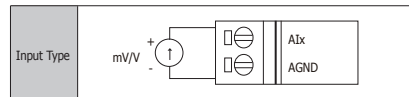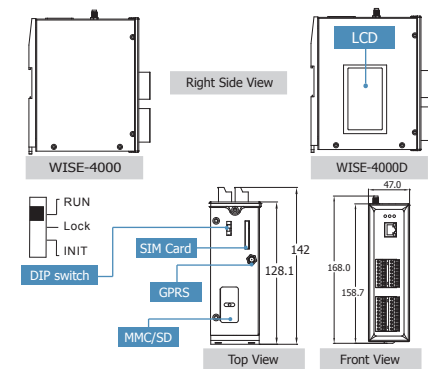
Ordering Information

WISE-4000	3-channel DI, 3-channel DO, and 8-channel AI WISE Controller with GPRS/GSM Module (RoHS)
WISE-4000D	3-channel DI, 3-channel DO, and 8-channel AI WISE Controller with GPRS/GSM Module and LCD Display (RoHS)

Accessories

ANT-421-01	3m external GPRS/GSM antenna