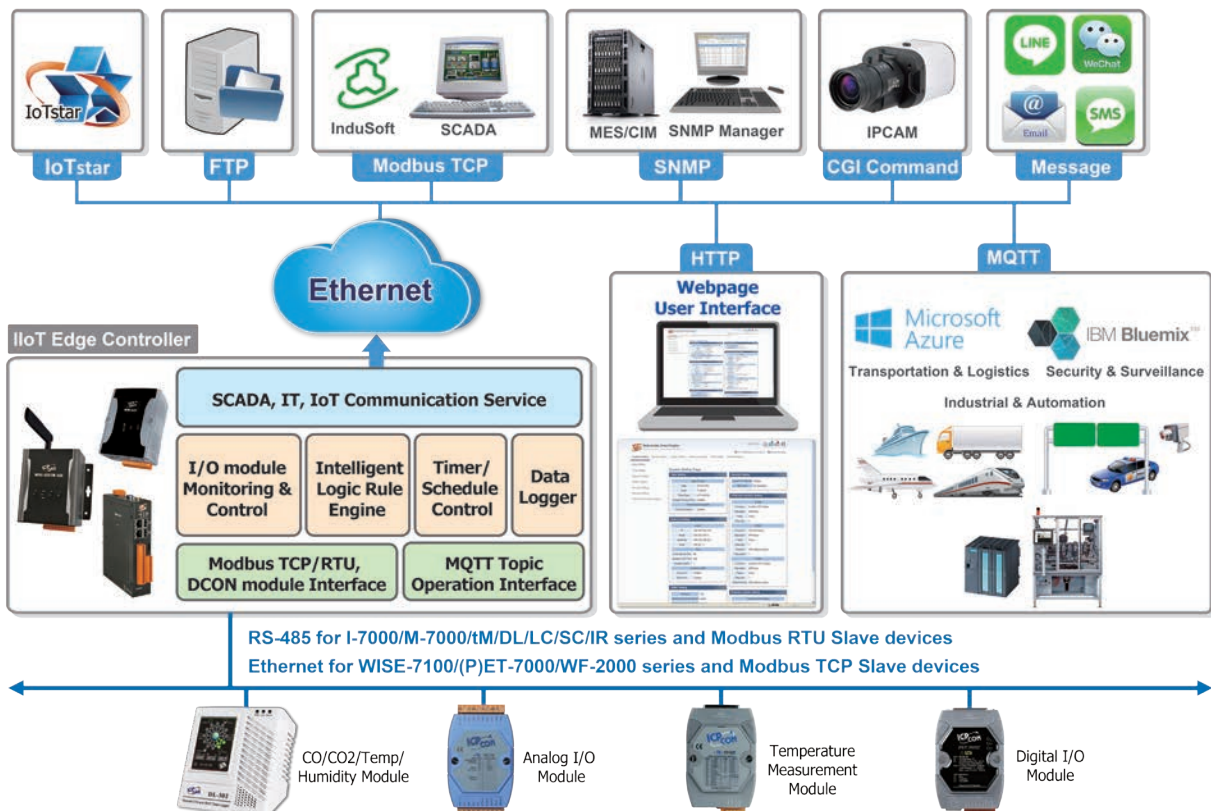## IIoT Edge Controller: WISE-523x & WISE-224xM Series

▣ Features

- No more programming, Web pages provided for system and logic rule setting
- IF-THEN-ELSE logic rules execution ability
- Support XV-board, DCON, Modbus TCP/RTU Slave modules
- Timer and Schedule functions supported
- Data logger and data files send back function supported
- Active I/O sending function for real-time data transfer

- Support math formula editing function
- CGI Command sending and receiving function supported for IP Camera and Network device
- Support Modbus TCP/RTU, SNMP, FTP and MQTT protocols
- Support Line, WeChat, SMS and Email message notification
- Support connection with IoT Cloud Platform (Microsoft Azure and IBM Bluemix) and IoTstar Cloud Management Software
- Support 4G/3G wireless data communication

◨ System Architecture

RS-485 for I-7000/M-7000/tM/DL/LC/SC/IR series and Modbus RTU Slave devices
Ethernet for WISE-7100/(P)ET-7000/WF-2000 series and Modbus TCP Slave devices

CO/CO2/Temp/Humidity Module   Analog I/O Module   Temperature Measurement Module   Digital I/O 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 the built-in IF-THEN-ELSE logic engine, WISE can execute the automation logic in a stable and efficient way, and it also provides mathematic operation, Schedule and Email alarm message sending functions.

WISE provides more supports in I/O module connection, I/O data logging and IoT platform integration. It allows connection to XV-board, DCON I/O modules, and Modbus TCP/RTU Slave modules all together. The wide range of selection options enables flexibility in I/O module integration to meet the requirements from various applications. WISE provides the MQTT client, it can directly connect to the major public IoT Cloud platform (such as: Microsoft Azure or IBM Bluemix) and MQTT Broker. WISE also provide well thought-out CGI command functions to integrate with IP camera for the Access Control applications. Based on the ability as I/O module connection ability, Intelligent logic control, Data logging, and various communication protocols supported (SNMP, MQTT and Modbus TCP/RTU), WISE can help the IT/MIS/MES/SCADA system to manage the field side I/O modules and sensors efficiently in the application such as Unmanned Facility Room Monitoring, Intelligent Factory and Environment Monitoring. WISE is not just a Concentrator of I/O modules and Sensors; it is also a Gateway to transfer the sensor data to IoT Cloud platform. All of these make WISE the best choice in the IoT Age.

■ Software Specifications

Function		Description
Easy to use	Web Page Interface	● No more programming/extra software tool！ Runs on browsers for system and logic rule setting.
Options for Sensor Integration	Local Side	● Support XV-board(XV107, XV107A, XV110, XV111, XV111A, XV116, XV306, XV307, XV308, XV310).
	Remote Side (RS-485)	● Support ICP DAS I-7000/M-7000/tM/DL/LC/IR and Modbus RTU Slave module.
	Remote Side (Ethernet)	● Support ICP DAS WISE-7100/(P)ET-7000/WF-2000 and Modbus TCP Slave module.
Edge Computing Ability at Field Sites	IF-THEN-ELSE Logic Operation	● Built-in advanced IF-THEN-ELSE logic engine provides for the execution of logic rules.
	I/O Channel Monitoring & Control	● Provides real-time monitoring and setting of I/O channel of sensor.
	Timer	● Perform the timing function. The status of Timer can be included in IF condition statements to trigger the THEN/ELSE actions.
	Schedule	● Perform the prescheduled tasks. The status of Schedule can be included in IF condition statements to trigger the THEN/ELSE actions. "Calendar" and "Weekly repeat" setting UI are provided.
	Instant Message Sending	● Support LINE, Email and SMS for instant message sending. WISE-5236 & WISE-2x46M support WeChat message sending function.
	CGI Command	● Perform CGI command sending and receiving functions. The content of CGI command receiving can be used in IF condition statements to trigger the THEN/ELSE actions.
	Data Logger	● Perform Data Logger function to real-time record the sensor data by Period or Event Trigger operation.
	Internal Register	● Work as a variable to hold the temporary value, and provide the basic mathematical operation.
Seamless Integration with SCADA/IT/IoT Systems	Real-Time Sensor Data	● Support Modbus TCP/RTU, CGI, SNMP and MQTT protocols for the integration with SCADA/IT/IoT systems. Active I/O sending mechanism supported.
	Historical Sensor Data Files	● FTP Server/Client ability for the maintenance of data log files and the data files automatically send back & recovery when disconnected network is resumed. ● Provide alarm notification mechanism so that when microSD card is damaged, the data log file will be stored in WISE to prevent data loss.
	Communication Service	● DDNS (Dynamic DNS) service supported. ● WISE-523xM-4GE/4GC for 4G Wireless data communication; WISE-5231M-3GWA for 3G Wireless data communication
	IoT Gateway Capability	● Support connection with IoT Cloud Platform (Microsoft Azure and IBM Bluemix) and IoTstar Cloud Management Software.

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■ Hardware Specifications

Model	WISE-224xM Series	WISE-523x Series	WISE-523xM Series
System			
CPU	ARM CPU, 1.0 GHz		
SDRAM/Flash	DDR3 512 MB / 256 MB		
microSD	Built-in one 4 GB microSD card (support up to 32 GB microSDHC card)		
Communication Interface			
Ethernet	RJ-45 x 2, 10/100/1000 Base-TX (Auto-negotiating, Auto MDI/MDI-X)	RJ-45 x 1, 10/100/1000 Base-TX (Auto-negotiating, Auto MDI/MDI-X)	
COM 2	RS-232 (TxD, RxD, GND), non-isolated, Speed: 115200 bps max		
COM 3/COM 4	RS-485 (Data+, Data-), Speed: 115200 bps max. Support 2500 VDC isolation.	RS-485 (Data+, Data-), Speed: 115200 bps max. COM 4 provides 2500 VDC isolation.	
I/O Module Support			
Local Side	Support ICP DAS XV-board		
Remote Side	* Support DCON or Modbus RTU Slave modules (Up to 32, COM3 and COM4 can connect to Max. 16 modules individually.) * Support Modbus TCP Slave modules (Up to 16)		
iCAM IP Camera	up to 4		
Power Requirements			
Input Range	12 to 48 VDC		
Consumption	Ethernet version: 4.8 W; -4GE/4GC/3GWA version: 6.5 W		
Mechanical			
Casing	Metal	Plastic	Metal
Dimensions (W x L x H; mm) /Installation	35 × 167 × 119; DIN-Rail Installation	91 x 132 x 52 ; DIN-Rail Installation	117 x 126 x 58 ; Wall Mounting/ DIN-Rail Installation
Environmental			
Temperature/ Humidity	Operating Temperature: -25 ° C to +75 ° C; Storage Temperature: -40 ° C to +80 ° C; 10 to 90% RH, Non-condensing		
Mobile Network Communication (apply to WISE-523xM-4GE/4GC/3GWA only)			
3G System (-3GWA)	WCDMA: 850/900/1900/2100 MHz		
3G/4G System (-4GE)	FDD LTE: B1/B3/B5/B7/B8/B20 bands (Frequency Band for EMEA, Korea, Thailand, India and Taiwan) WCDMA: 850/900/2100 MHz		
3G/4G System (-4GC)	FDD LTE: B1/B3/B8 bands (Frequency Band for China) TDD LTE: B38/B39/B40/B41 bands (Frequency Band for China) WCDMA: 900/2100 MHz, TD-SCDMA 1900/2100 MHz, CDMA2000 (BC0) 800 MHz		

■ Supported I/O Module

► Module Specification

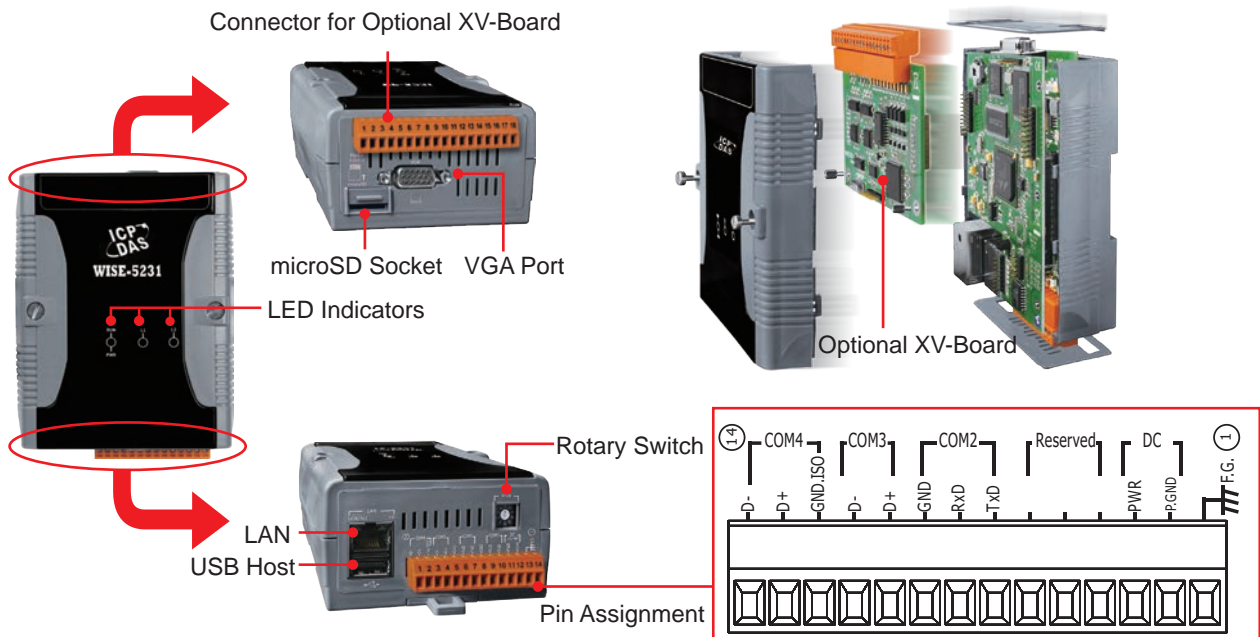| I/O Module Specification		Description	Max. Connection Allowed
I/O Module for Local site	Local Bus	ICP DAS: XV-Board series module	1
I/O Module for Remote site	DCON by RS-485	ICP DAS : I-7000/DL series module	COM3 and COM4 can connect up to 16 modules individually.
	Modbus RTU by RS-485	ICP DAS : M-7000/tM/DL/LC/IR series module Others : modules that support Modbus RTU Slave Protocol	
	Modbus TCP by Ethernet	ICP DAS : WISE-7100/(P)ET-7000/ WF-2000 series module Others : modules that support Modbus TCP Slave Protocol	LAN interface can connect up to 16 modules.
IP Camera		ICP DAS : iCAM series module	LAN interface can connect up to 4 cameras.

► List of Supported Modules

Function		Model List
I-7000 Module		
AI/AO	Voltage & Current	I-7012, I-7012D, I-7012F, I-7012FD, I-7017, I-7017F, I-7017R, I-7017C, I-7017FC, I-7017RC, I-7017R-A5, I-7017Z
	Thermocouple	I-7011, I-7011D, I-7011P, I-7011PD, I-7018, I-7018P, I-7018R, I-7018Z, I-7019R
	RTD	I-7013, I-7013D, I-7015, I-7015P, I-7033, I-7033D
	Thermistor	I-7005
	Transmitter	I-7014D
	Strain Gauge	I-7016, I-7016D, I-7016P, I-7016PD
	Analog Output	I-7021, I-7021P, I-7022, I-7024, I-7024R
DI/DO	DC Digital Input	I-7041, I-7041D, I-7041P, I-7041PD, I-7051, I-7051D, I-7052, I-7052D, I-7053_FG, I-7053D_FG
	AC Digital Input	I-7058, I-7058D, I-7059, I-7059D
	DC Digital Output	I-7042, I-7042D, I-7043, I-7043D, I-7045, I-7045D, I-7045-NPN, I-7045D-NPN
	DC Digital Input & Output	I-7044, I-7044D, I-7050, I-7050D, I-7050A, I-7050AD, I-7055, I-7055D, I-7055-NPN, I-7055D-NPN
Relay Output	Power Relay Output	I-7060, I-7060D, I-7061, I-7061D, I-7063, I-7063D, I-7065, I-7065D, I-7067, I-7067D
	Solid State Relay Output	I-7063A, I-7063AD, I-7063B, I-7063BD, I-7065A, I-7065AD, I-7065B, I-7065BD
	Photomos Relay Output	I-7066, I-7066D
Others	Counter/Frequency	I-7080, I-7080D, I-7080B, I-7080BD, I-7088, I-7088D

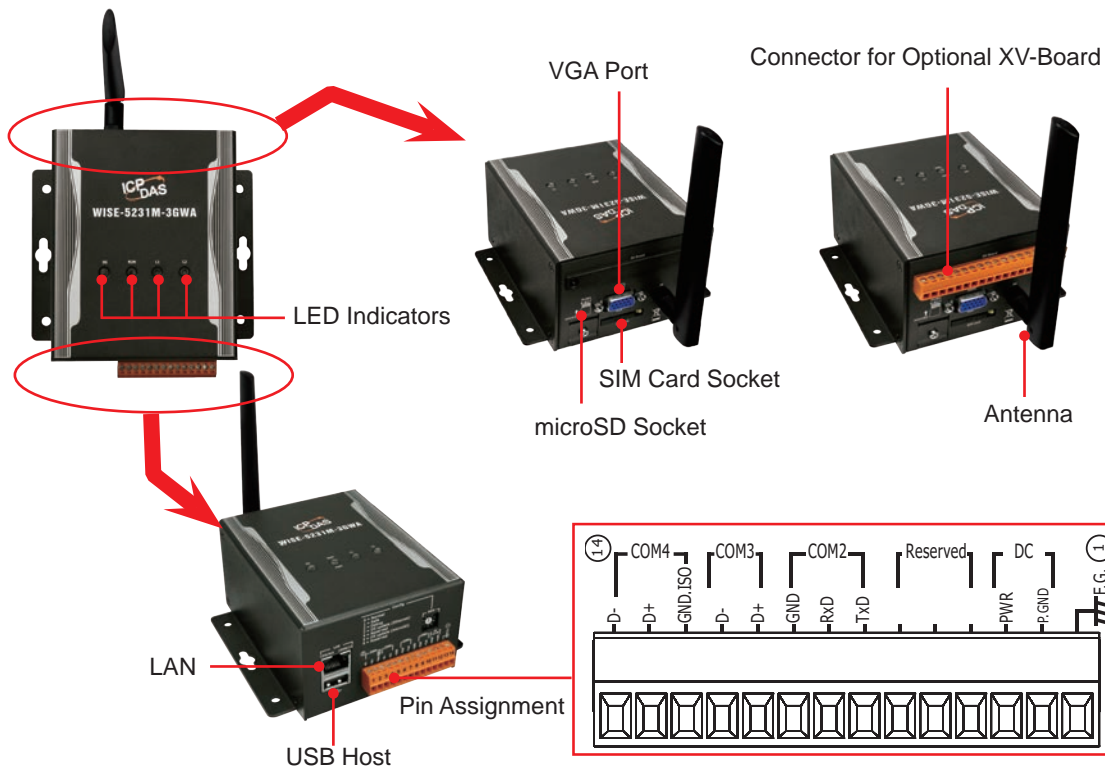| Function		Model List
M-7000 Module		
AI/AO	Voltage & Current	M-7017, M-7017C, M-7017R, M-7017R-A5,M-7017RC, M-7017Z
	Thermocouple	M-7011, M-7011D, M-7018, M-7018R, M-7018Z, M-7019R,M-7019Z
	RTD	M-7015, M-7015P
	Thermistor	M-7005
	Strain Gauge	M-7016, M-7016D
	Analog Output	M-7022, M-7024, M-7024R, M-7024L, M-7028, M-7028D
	RMS Input	M-7017RMS
DI/DO	DC Digital Input	M-7041, M-7041D, M-7041P, M-7041PD, M-7041-A5, M-7041D-A5, M-7046, M-7046D, M-7051, M-7051D, M-7052, M-7052D, M-7053, M-7053D
	AC Digital Input	M-7058, M-7058D, M-7059, M-7059D
	DC Digital Output	M-7043, M-7043D, M-7045, M-7045D, M-7045-NPN, M-7045D-NPN
	DC Digital Input & Output	M-7050, M-7050D, M-7055, M-7055D, M-7055-NPN, M-7055D-NPN
Relay Output	Power Relay Output	M-7060, M-7060D, M-7060P, M-7060PD, M-7061, M-7061D, M-7064, M-7064D, M-7065, M-7065D, M-7067, M-7067D, M-7068, M-7068D, M-7069, M-7069D
	Solid State Relay Output	M-7065B, M-7065BD
	Photomos Relay Output	M-7066P, M-7066PD
Others	Counter/Frequency	M-7080, M-7080D, M-7080B, M-7080BD, M-7084, M-7088, M-7088D
	Multi-Function	M-7002, M-7003, M-7024U, M-7024UD, M-7026
tM Module		
AI/AO	Voltage & Current	tM-AD2, tM-AD5, tM-AD5C, tM-AD8, tM-AD8C
	Thermistor	tM-TH8
DI/DO	DC Digital Input	tM-P8
	DC Digital Output	tM-C8
	DC Digital Input & Output	tM-P4A4, tM-P4C4
Relay Output	Power Relay Output	tM-P3R3, tM-R5
	Photomos Relay Output	tM-P3POR3
Others	Multi-Function	tM-DA1P1R1, tM-AD4P2C2
(P)ET-7000 Module		
AI/AO	Voltage & Current	(P)ET-7017, (P)ET-7217, (P)ET-7017-10, (P)ET-7217-10
	Thermocouple	(P)ET-7018Z, (P)ET-7019Z, (P)ET-7218Z, (P)ET-7219Z
	RTD	(P)ET-7015, (P)ET-7215
	Thermistor	(P)ET-7005
DI/DO	DC Digital Input	(P)ET-7051, (P)ET-7053, (P)ET-7251, (P)ET-7253
	DC Digital Output	(P)ET-7042, (P)ET-7242
	DC Digital Input & Output	(P)ET-7044, (P)ET-7050, (P)ET-7052, (P)ET-7244, (P)ET-7250A, (P)ET-7252, (P)ET-7255
Relay Output	Power Relay Output	(P)ET-7060, (P)ET-7067, (P)ET-7260, (P)ET-7261, (P)ET-7267
	Photomos Relay Output	(P)ET-7065, (P)ET-7066
Others	Multi-Function	(P)ET-7002, (P)ET-7016, (P)ET-7024, (P)ET-7026, (P)ET-7202, (P)ET-7224, (P)ET-7226

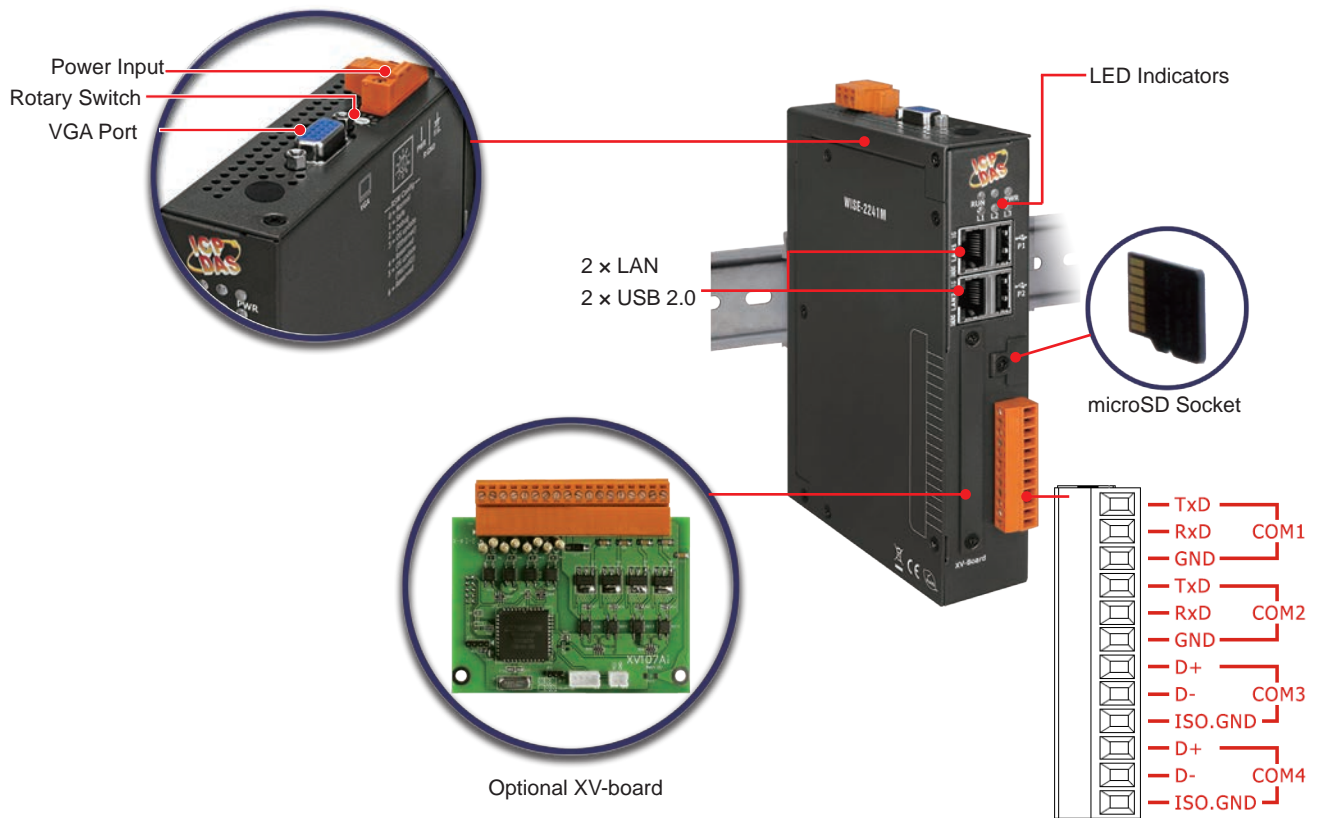| Function		Model List
WISE-7000 Module		
AI/AO	Voltage & Current	WISE-7117
	Thermocouple	WISE-7118Z
	RTD	WISE-7115
	Thermistor	WISE-7105
DI/DO	DC Digital Input	WISE-7151, WISE-7153
	DC Digital Output	WISE-7142
	DC Digital Input & Output	WISE-7144, WISE-7150, WISE-7152, WISE-7255
Relay Output	Power Relay Output	WISE-7160, WISE-7167
Others	Multi-Function	WISE-7102, WISE-7126
WF-2000 Module		
AI/AO	Voltage & Current	WF-2017
	Thermocouple	WF-2019/S
DI/DO	DC Digital Input	WF-2051
	DC Digital Output	WF-2042
	DC Digital Input & Output	WF-2055
Relay Output	Power Relay Output	WF-2060
Others	Multi-Function	WF-2026
LC Module		
DI/DO	AC Digital Input	LC-101H, LC-103H
	DC Digital Output	LC-131
DL Module		
Temperature / Humidity		DL-10, DL-100
CO / CO2 / Temperature / Humidity		DL-301, DL-302, DL-303
PM1 / PM2.5 / PM10 / CO / CO2 / Temperature / Humidity		DL-1020, DL-1021, DL-1022, DL-1023, DL-1038, DL-1050
IR Module		
IR Learning Remote Module		IR-210, IR-712A, IR-712-MTCP
XV-Board Module		
DI/DO	DC Digital Input	XV110
	DC Digital Output	XV111, XV111A
	DC Digital Input & Output	XV107, XV107A
Relay Output	Power Relay Output	XV116
Others	Multi-Function	XV306, XV307, XV308, XV310
Modbus RTU/TCP Slave Module		
Coil Output / Discrete Input / Input Register / Holding Register		

WISE-523x

Connector for Optional XV-Board

microSD Socket   VGA Port

LED Indicators

Optional XV-Board

WISE-5231

Rotary Switch

LAN

USB Host

Pin Assignment

14	COM4			COM3		COM2			Reserved		DC		1
D-	D+	GND.ISO	D-	D+	GND	RxD	TxD				PWR	P.GND	F.G.

WISE-523xM-4GE/4GC & WISE-5231M-3GWA

VGA Port

Connector for Optional XV-Board

WISE-5231M-3GWA

LED Indicators

SIM Card Socket

microSD Socket

Antenna

LAN

Pin Assignment

USB Host

14	COM4			COM3		COM2			Reserved		DC		1
D-	D+	GND.ISO	D-	D+	GND	RxD	TxD				PWR	P.GND	F.G.

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WISE-224xM

Power Input
Rotary Switch
VGA Port

LED Indicators

2 × LAN
2 × USB 2.0

microSD Socket

Optional XV-board

TxD
RxD — COM1
GND
TxD
RxD — COM2
GND
D+
D- — COM3
ISO.GND
D+
D- — COM4
ISO.GND

■ Ordering Information

Module	Description
Standard Function	
WISE-5231 CR	IIoT Edge Controller (Plastic casing) Art. n° 147462
WISE-5231M CR	IIoT Edge Controller (Metal casing) Art. n° 163494
WISE-5231M-3GWA CR	IIoT Edge Controller (Metal casing) (Support 3G Wireless data communication) Art. n° 155673
WISE-5231M-4GE CR	IIoT Edge Controller (Metal casing) (Support 4G Wireless data communication; Frequency Band for EMEA, Korea, Thailand, India and Taiwan) Art. n° 157016
WISE-2241M CR	IIoT Edge Controller (Metal casing) Art. n° 159511

■ Accessories

MDR-20-24 CR	24V/1A, 24 W Power Supply with DIN-Rail Mounting (RoHS)
ANT-Base-01	5 dBi 4G External Antenna Base (1.5 Meter)
3S001-2	RG58A/U (1 Meter; SMA male to SMA Female)