M2M SYSTEM INTEGRATION

MACHINE TO MACHINE SOLUTIONS

Vol. IMS 1105

ICP DAS CO., LTD.

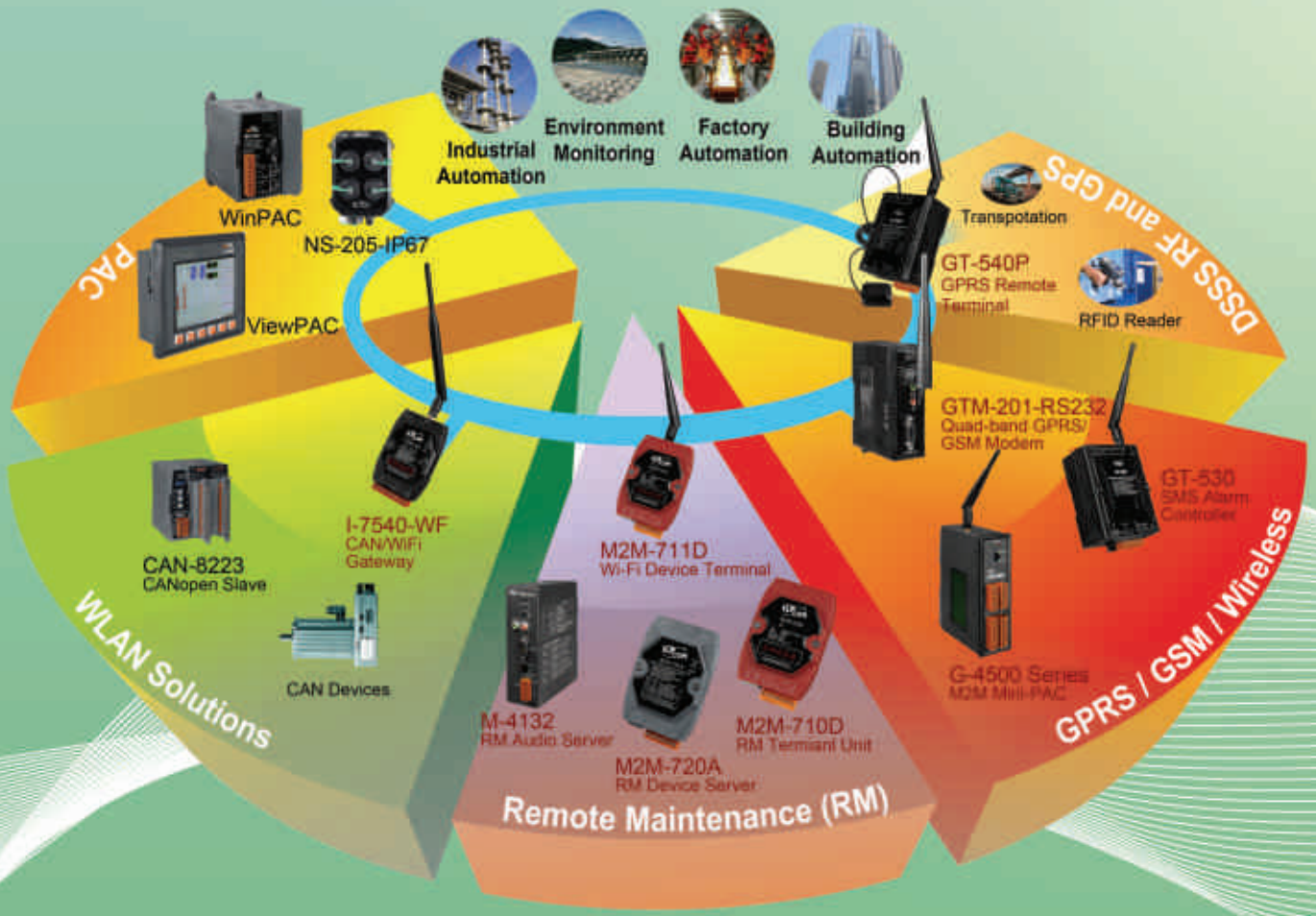
M2M Overview

Machine to Machine, Mobile, Man communications is a new business concept, borne from the original telemetry technology, used for automatic transmission, remote maintenance and measurement of data from remote sources by wire, radio or other means. It makes the message exchangeable among machinery equipment, people, and the controlling system itself.
Based on the above, ICP DAS has developed the robust M2M communication products and platforms that can be quickly fitted to these M2M solutions including GPRS/GSM wireless, ZigBee wireless, WiFi wireless, and remote maintenance solutions.

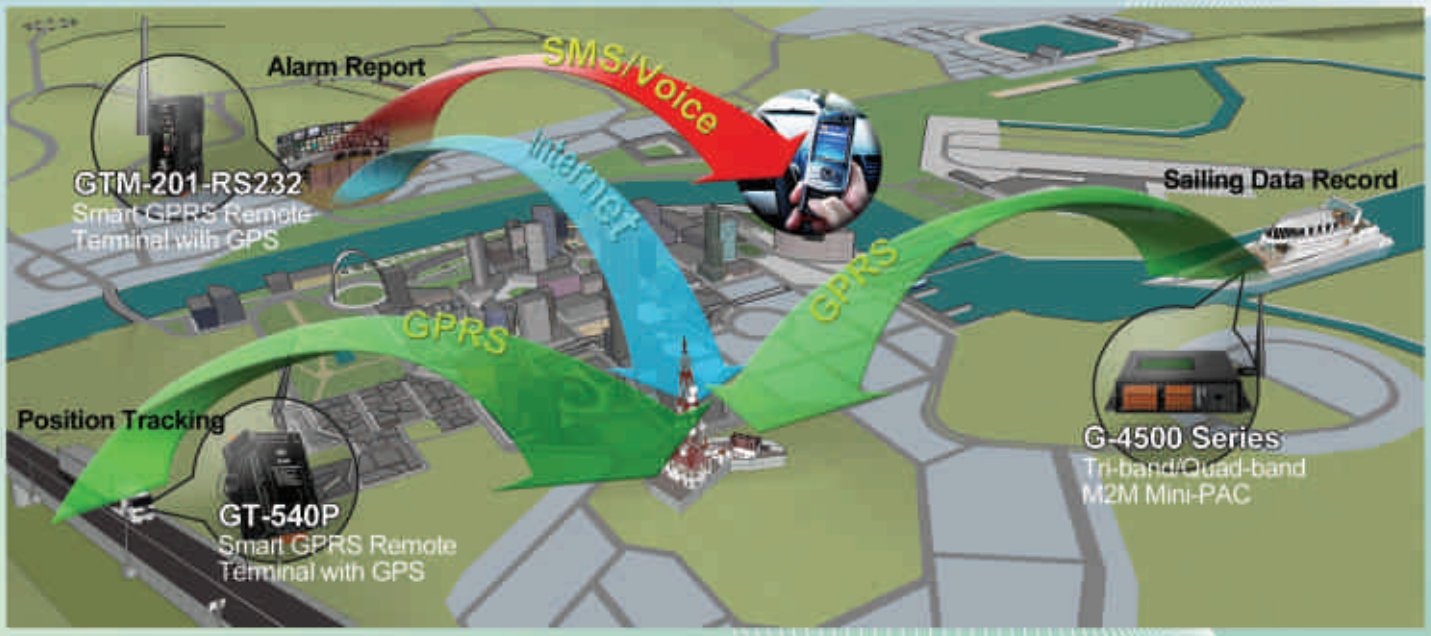
M2M General Features

- Full solutions for M2M application include GPRS/GSM/ZigBee/WiFi wireless and Remote maintenance solutions
- No need to build expensive fixed line network, and save cost substantially on GPRS/GSM/ZigBee/Wifi network
- GPRS/GSM wireless solution offers a complete asset monitoring solution that reduces costs, increases revenue and improves customer service.
- Communicate reliably with any remote equipment in real time.
- Remote maintenance, Remote diagnostic, and Remote monitoring solutions

M2M Series Architecture



2G/3G Solutions

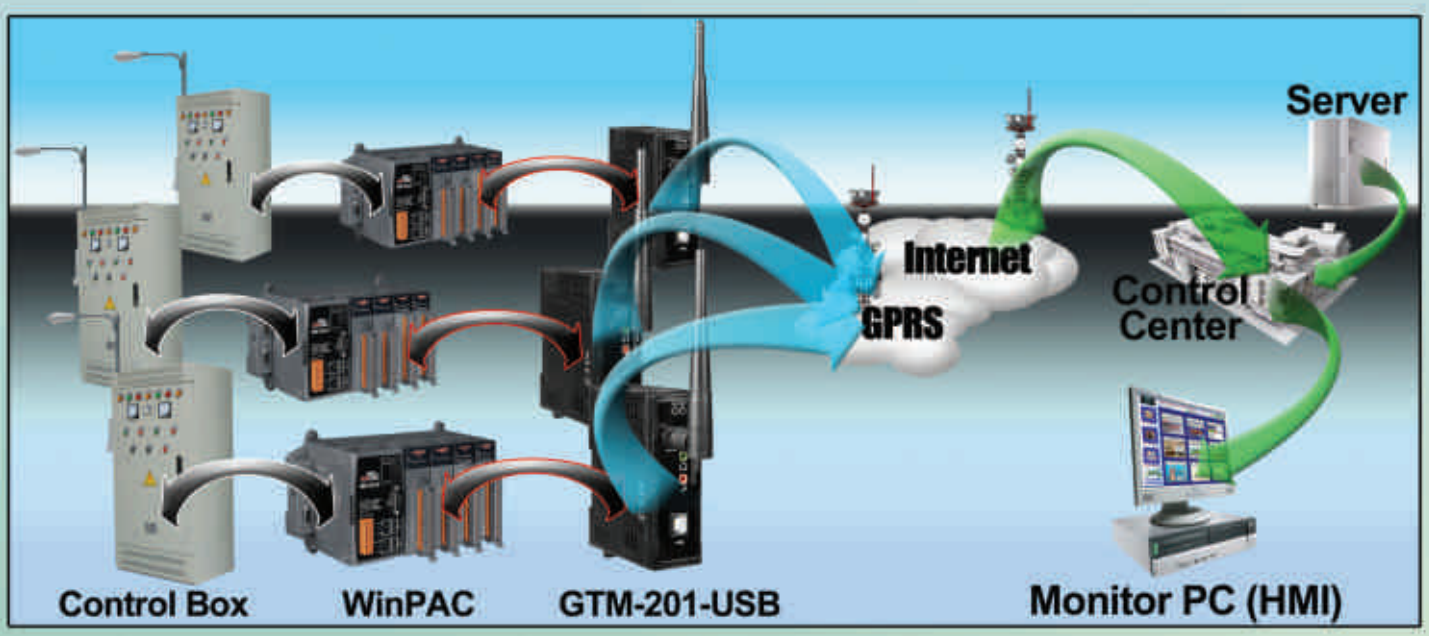


ICP DAS 2G/3G solutions are uniquely designed to meet the challenges of implementing and managing a small, medium and large number of unmanned remote devices as well as mobile terminals using the 2G/3G network. The ICP DAS 2G/3G wireless system is comprised of intelligent 2G/3G modems with versatile interfaces, a 2G/3G Data Server (DS) and 2G/3G mini PACs with embedded dynamic IP resolution technology to help system integrators and application services providers can quickly integrate 2G/3G technology into their own solutions, and save development time with reduces costs and assured performance.

Advantages & Benefits of 2G/3G Solutions

- ☑ There is no need to build an expensive fixed-line network.
- ☑ Enable any devices to be connected to the internet via serial port over a 2G/3G network.
- ☑ The most efficient method of handling data over a 2G/3G wireless network and internet.
- ☑ A full turnkey solution that is designed for both fixed and mobile machine to machine applications.

Product	Description
 GTM-201 series	Industrial 2G/3G modems GTM-201 series are industrial Quad-band 2G modems or Tri-band 3G modems with RS232 and USB interfaces. The modems utilize the 2G/3G network for convenient and inexpensive data transfer from remote instruments.
 GT-5xx Series	Intelligent GPRS/GSM DS modules GT-5xx series is GSM remote control and alarm system allows users to use their mobile phone to monitor and control the business from any location.
 G-4500 series	Remote maintenance GPRS Device Terminal Unit The G-4500 series provided by ICP DAS are M2M (Machine to Machine) mini programmable controller with a cellular transceiver can monitoring industrial equipment that sends live data to the monitoring system, providing real-time status.



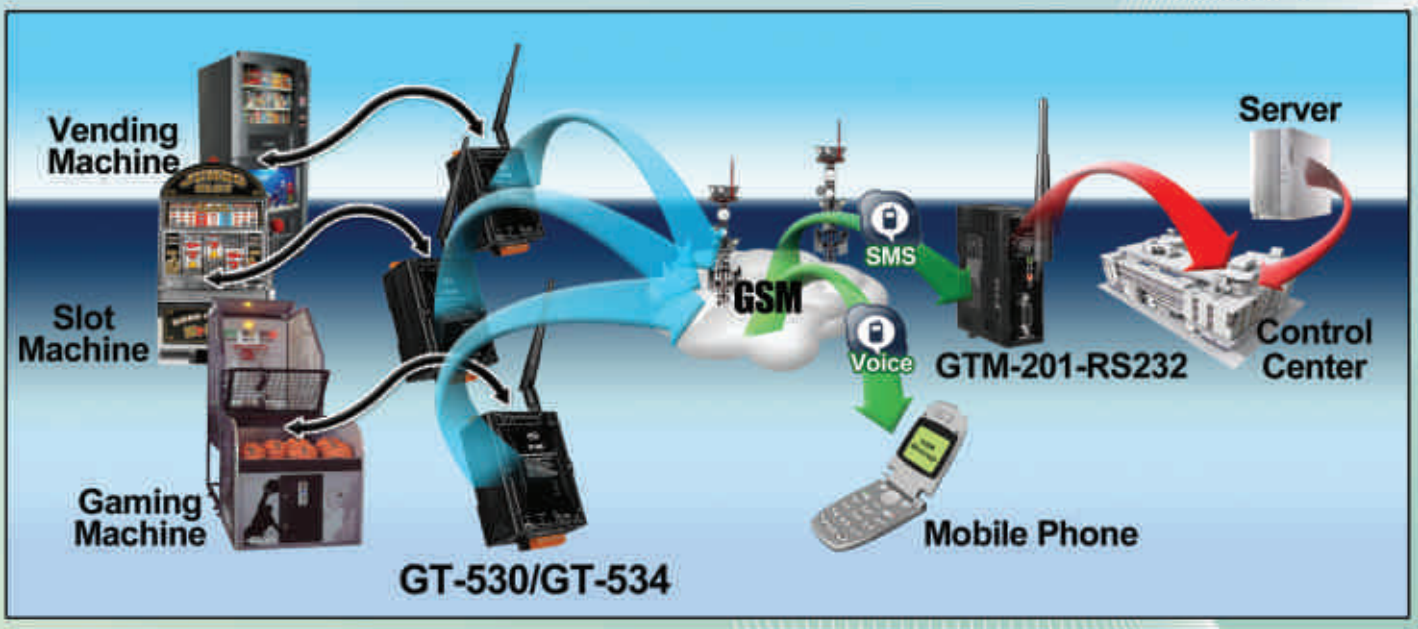
ICP DAS provides various industrial Quad-band 2G or Tri-band 3G modems or modules. The products utilize the 2G/3G network for convenient and inexpensive data transfer from remote instruments, meters, computers or control systems in either live data or packet data. Both modem and module have the integrated TCP/IP stack so that even simple controllers with serial communications ports can be connected to the modem without the need for special driver implementation. With the features of modems and modules provided by ICP DAS, the systems can be SMS and 2G/3G connected applications with various PLC and PC. Moreover, with the voice interface, these modems can also be applied to the alarm system with sounds.

2G/3G Modems

- ☑ Support 2G Quad-band or 3G Tri-band 3G
- ☑ Designed for Data, SMS and Voice Applications
- ☑ Support TCP Server, TCP Client, UDP Client Connection from 2G/3G network.
- ☑ Support Standard AT Commands
- ☑ A Digital Input Channel for Resetting the System
- ☑ Provide the MIC Input and Speaker (32 Ω) Output Interface

Comparison Table

Models	GTM-201-RS232	GTM-201-USB	GTM-201-3GWA	GTM-201P-3GWA	I-8212W	I-8213W
Frequency Band	Quad-band 2G		Tri-band 3G		Quad-band 2G	
Download Speed	Max. 85.6 kbps		Max. 7.2 Mbps (3G) Max. 85.6 kbps (2G)		Max. 85.6 kbps	
Comm. Interfaces	RS-232	USB 2.0	RS-232, USB 2.0		--	
SMS	Text, PDU		MT, MO, CB, Text, PDU		Text, PDU	
GPS System	--			Yes	--	Yes
GPS Protocol	--			NMEA 0183	--	NMEA 0183



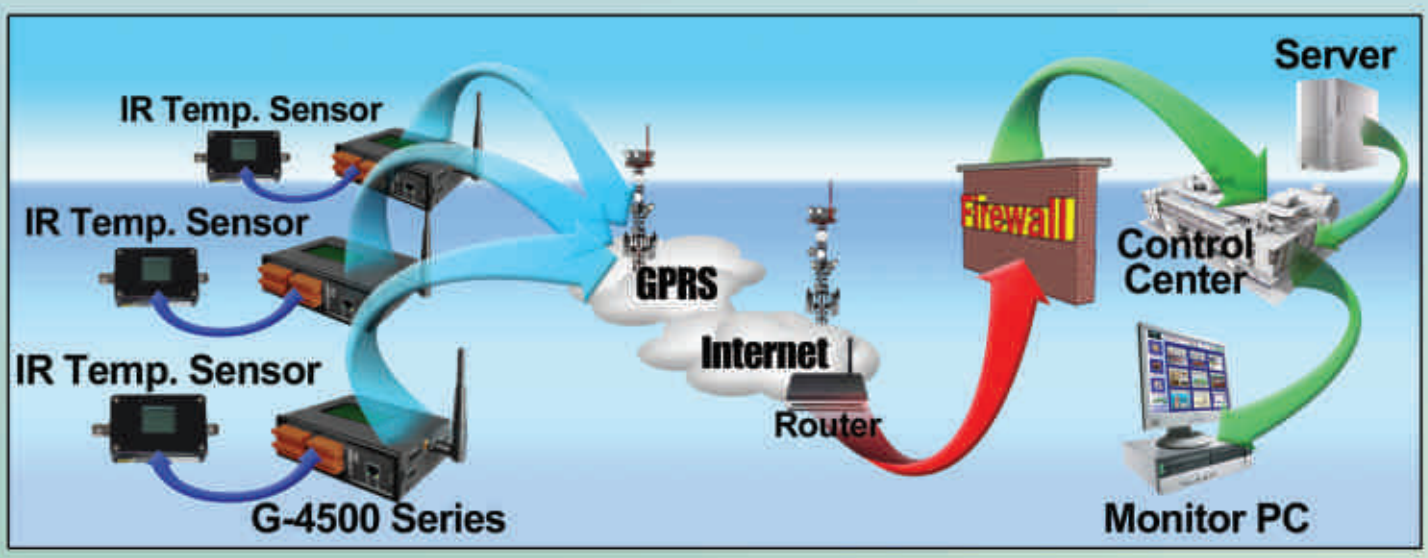
ICP DAS provides various intelligent 2G/3G modules and gateway, GT-5xx Series. The module is GSM remote control and alarm system allows users to use their mobile phone to monitor and control the business from any location. Its alarm facilities provide a flexible way to distribute critical alarm information to any number of mobile phone users. The Gateway allows user to access mobile phone by using standard protocol, such as Modbus.

GT-5xx Intelligent GPRS/GSM Modules

- GPRS/GSM remote control and alarm system allows users to monitor and control the business from any location without any programming.
- Support M2M OPC Server and Modbus RTU protocol.
- Support data transferring by SMS, E-mail, or GPRS.
- Automatic/continuous GPRS link management.
- Support 3.7V Li-ion Battery backup and I/O data logging.

Comparison Table

Models	GT-530	GT-531	GT-534	GT-540	GT-540P	GT-543
Frequency Band	Quad-band 2G (850/900/1800/1900 MHz)					
Interface	2 x RS-232	2 x RS-232 1 x RS-485	1 x RS-232 1 x RS-232/485	1 x RS-232 1 x RS-485	1 x RS-232 1 x RS-485 GPS	2 x RS-232 1 x RS-485
I/O	2 x DO 10 x DI	None	2 x DO 6 x DI 1 x AI	2 x DO 6 x DI 1 x AI	3 x DO 3 x DI 8 x AI	None
Alarm	SMS	SMS/Voice	SMS/Voice	GPRS	GPRS	No
Battery Backup	Yes	No	Yes	No	NO	No
Transparent Communication	SMS	Modbus RTU	SMS	GPRS	GPRS	GPRS



The G-4500 series provided by ICP DAS are M2M mini programmable automation controller with a cellular transceiver can monitor industrial equipment that sends live data to the monitoring system, providing real-time status. With optional GPS model, the G-4500 can also be a GPS tracking system. It can be used in vehicle management or maritime system.

2G/3G Modems

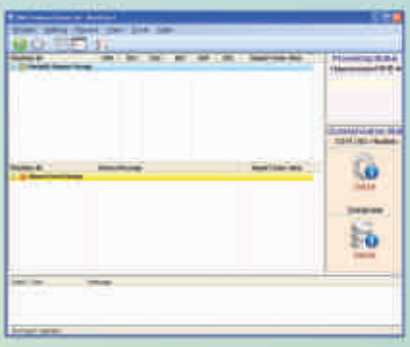
- ☑ Embedded MiniOS7, anti-virus
- ☑ Support a variety of TCP/IP features, including TCP, UDP, IP, ICMP, ARP
- ☑ Build-in self-tuner ASIC controller on RS-485 port
- ☑ Support Tri-band 3G (900/1800/1900 MHz) or Quad-band 2G (850/900/1800/1900 MHz)
- ☑ Support TCP server, TCP client, UDP client connection from GPRS

Comparison Table

Models	G-4500(D)-2G	G-4500P(D)-2G	G-4500(D)-3GWA	G-4500P(D)-3GWA
Flash/RAM	512/512 KB			
Frequency Band	Quad-band 2G		Tri-band 3G	
Interface	1 x Ethernet 2 x RS-232 1 x RS-485	1 x Ethernet 2 x RS-232 1 x RS-485 GPS	1 x Ethernet 2 x RS-232 1 x RS-485	1 x Ethernet 2 x RS-232 1 x RS-485 GPS
I/O	3 x DO、3 x DI、8 x AI			
Download Speed	Downloading: 85.6kbps Uploading: 42.8 kbps		Downloading: 7.2 Mbps Uploading: 5.76 Mbps	

SMS Database System

ICP DAS's SMS Database System is a software solution that allows to manage remote GT-53x series more efficiently. GT-53x series are intelligent GSM controllers great for use in industry applications; they feature easy-to-use interface, and SMS tunnel function voice communication.

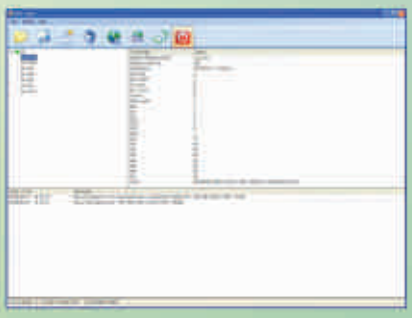


- Quickly and easily build a GT-53x management system
- Support MS SQL Server and MS Access 2003 Database
- Provide back up mechanism in local sites
- Allow to view real-time or historical data of SMS message sent by GT-53x series
- Support filter function that enables to receive SMS message by specified phone numbers

http://m2m.icpdas.com/SMS_DBS.html

M2M RTU Center (FREE)

The M2M RTU Center is a M2M (Machine to Machine) management software that has a strong core technology for handling data and lets the user save the trouble of dealing with large IO data. The RTU Center supports the G-4500 RTU, GT-540 and other RTU products in ICP DAS that allow users to manage these RTU devices remotely.

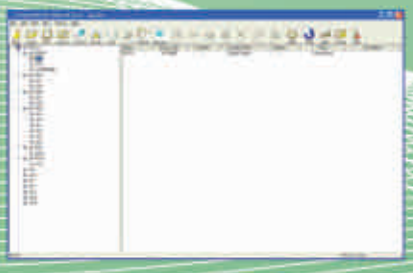


- RTU series Management tool
- Manage up to 128 RTU devices
- Help users to connect to any Modbus device to GPRS/Ethernet by RTU devices
- Easy and quick to build a Remote monitor system
- Support NAPOPC.M2M server, EzDatalog and M2M API tool of ICP DAS

http://m2m.icpdas.com/m2m_rtu.html

NAPOPC.M2M DA Server (FREE)

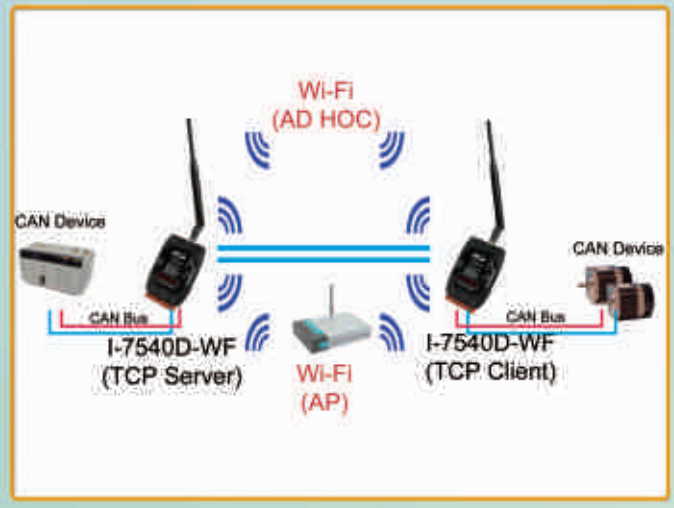
ICP DAS NAPOPC.M2M DA Server is an OPC software package operated as an OPC driver of a HMI or SCADA system. It provides seamless connection with GPRS RTU products (G-4500 RTU, GT-540…) from ICP DAS to SCADA system (InduSoft, Wonderware, iFix, Citec, LabView and etc) following OPC 2.0 Data Access Standards.



- Provide friendly interface
- Automatically search the RTU devices on the network
- Monitor and Control the RTU devices in real-time
- Integrated with M2M RTU Center and varies SCADA software such as InduSoft, LabView...etc.

http://m2m.icpdas.com/NAPOPC_M2M.html

WLAN Solutions



Setting up a fixed-line network on site is relatively complicated, makes the aqricultural production technology underdeveloped, and left behind the state of the art in factories of manufactured products. The application shown above is a project aiming to improve the production process in fish farms using new perception, control and automation technologies.

Controller Area Network (CAN) is a message-based protocol, designed specifically for automotive applications but now also used in other areas such as industrial automation and medical equipment. ICP DAS CAN to Wi-Fi product supports the wireless transmission of CAN data between various CAN networks or a CAN network and a WLAN network according to the 802.11b/g standard.

WLAN Remote Maintenance Device

M2M-711D

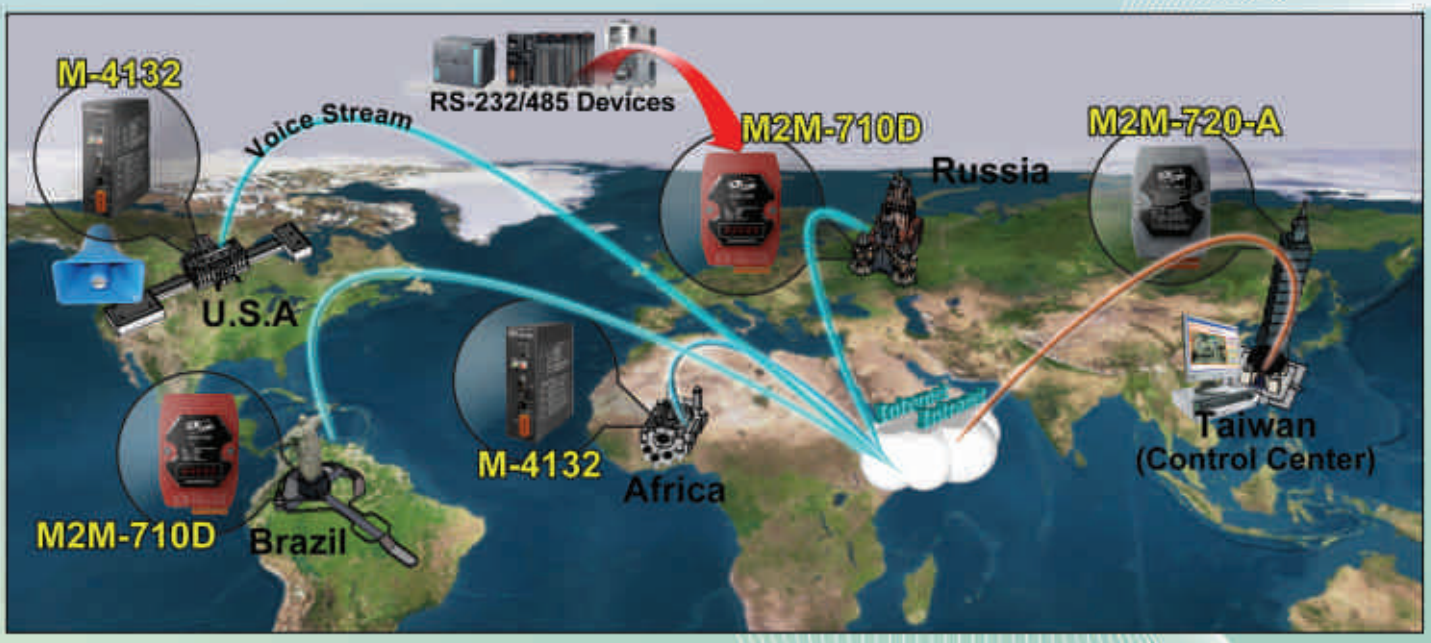
- ☑ Supply static IP/DHCP (Ad Hoc mode doesn't support DHCP)
- ☑ Ethernet Protocol: TCP, UDP, IP, ICMP, ARP, RARP
- ☑ Provide dynamic DNS function
- ☑ Support IEEE 802.11 b/g for Wi-Fi mode and Ad Hoc mode
- ☑ Support WEP-64, WEP-128, WPA-TKIP and WPA2-AES encryption for Wi-Fi mode
- ☑ Accommodatingly with M-4132, M2M-720A, M2M-710D

CAN to Wi-Fi Converter

I-7540D-WF

- ☑ Support infrastructure and ad-hoc operation modes
- ☑ CAN 2.0A/2.0B compliant
- ☑ Connect CAN networks via a WLAN bridge
- ☑ Communication efficiency is up to 700 fps (one way) and 350 fps (two way)

Remote Maintenance Solutions



The M2M series is specially designed for the remote maintenance and serial to network upgrading solution. This module provides 2 major technologies on networking: Voice streaming and Pair connection. The Pair connection provides TCP data tunneling between 2 serial devices so that the user can operate remote COM port device via Ethernet TCP/IP protocol just like a local COM port. The Voice streaming allows user to talk to remote operator while operate remote COM-linked devices.

With the M2M series and the technology applied, the maintenance man can take the remote maintenance or monitor whenever the time is and whatever the place located.

Remote Maintenance Device Server

M-4132/M2M-720-A

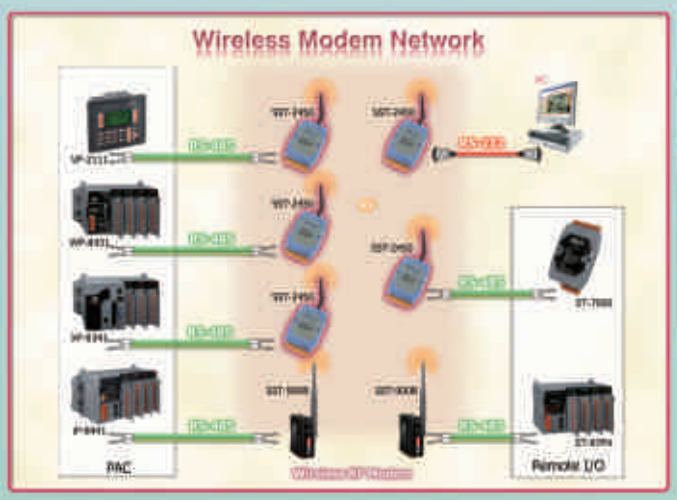
- Support voice streaming on network
- Provide pair connection (RS-232, RS-485) on network
- Establish the remote maintenance system of the equipments sold in the world
- Server mode can manage max 64 clients
- Support server and client function, and voice broadcast function in server Mode
- Web-based administration, Virtual COM technology, event record and e-mail function
- Provide dynamic DNS function to resolve the problem without the fixed real

Remote Maintenance Device Terminal Unit

M2M-710D/ M2M-711D

- Provide pair connection (RS-232, RS-485) on network
- Support Server/Client mode and VxComm function in server mode
- Web-based administration
- Built-in MiniOS7 to keep off the computer virus
- Support TCP, UDP, IP, ICMP, ARP, RARP, and provide dynamic DNS function

DSSS RF / GPS Solutions



ICP DAS provides SST series which is designed for data acquisition and control applications between a host and remote sensors. It is also useful for those applications where the installation of cable wire is inconvenient. The SST Series is a spread spectrum radio modem with an RS-232/RS-485 interface port.

GPS (Global Positioning System) is widely used for driving navigation, geographic monitoring, fleet management and cargo tracking, etc. We also can use GPS for industrial application according to its longitude and latitude value and UTC time. ICP DAS provides various modules for different applications.

DSSS RF Modem

SST-2450/SST-900B

- Full-duplex and Half-duplex up to 57600bps
- Auto band-rate settings
- Direct sequence spread spectrum using RF technology
- Reduce wiring cost and inconvenience

2G/3G Module and mini PAC with GPS

GT-540P/G-4500P(D)-2G/G-4500P(D)-3GWA

- Apply for Automotive, Marine or Personal positioning and navigation
- Correct time from Satellite
- Easy installation
- Support Modbus protocol
- High reliability in harsh environment

2G/3G Solutions

Model	Description
2G/3G Modems	
GTM-201-RS232/USB	Industrial Quad-band GPRS/GSM Modem With RS-232/USB Interface
GTM-201(P)-3GWA	Industrial (GPS) Tri-band 3G WCDMA Modem With RS232 and USB Interface
I-8212W	Industrial Quad-band 2G GSM/GPRS Module
I-8213W	Industrial Quad-band 2G GSM/GPRS Module With GPS Function
Intelligent GPRS/GSM Modules	
GT-530	Intelligent SMS Alarm Controller
GT-531	Intelligent Modbus SMS/GSM Gateway
GT-534	Intelligent SMS/GSM Alarm Controller
GT-540	Intelligent GPRS Remote Terminal Unit
GT-540P	Intelligent GPRS Remote Terminal Unit with GPS
GT-543	Intelligent Multi-port Serial to GPRS Gateway
Mini-PAC with 2G/3G and Multi I/O	
G-4500-2G Series	Quad-band 2G M2M Mini-PAC (RoHS) With Option LCD Display or GPS Function
G-4500-3GWA Series	Tri-band 3G M2M Mini-PAC (RoHS) With Option LCD Display or GPS Function

WLAN Solutions

Model	Description
M2M-711D	Remote maintenance Wi-Fi Device Terminal Unit
I-7540D-WF	CAN to Wi-Fi Converter

Remote Maintenance Solutions

Model	Description
M-4132	Remote Maintenance Device Server With Audio Communication
M2M-720-A	Intelligent Remote Maintenance Device Server
M2M-710D	Remote Maintenance Ethernet Device Terminal Unit
M2M-711D	Remote Maintenance Wi-Fi Device Terminal Unit

DSSS RF / GPS Solutions

Model	Description
SST-2450	Wireless Modem Module (2450 MHz) With RS-232/RS-485 Interface
SST-900B	Wireless Modem Module (900 MHz) With RS-232/RS-485 Interface
GT-540P	Intelligent GPRS Remote Terminal Unit With GPS
G-4500P(D)-2G	Quad-band 2G GSM/GPRS M2M Mini-PAC With (LCD Display and) GPS Function (RoHS)
G-4500P(D)-3GWA	Tri-band 3G WCDMA M2M Mini-PAC With (LCD Display and) GPS Function (RoHS)

ICP DAS Catalogs

High Reliability Industrial Ethernet Switch Catalog

- Managed Ethernet Switches
- Unmanaged Ethernet Switches
  PoE Ethernet Switches
- Media Converters
- Real-time Redundant Ring Ethernet Switches
- IP67 Waterproof Switches
- Cyber-Ring Ethernet Self-healing Technology

Industrial Communication & Networking Products Catalog

- Multi-port Serial Cards
- Programmable Device Servers (Serial-to-Ethernet)
- Converters, Repeaters and Hubs
- Fieldbus Solutions
- Ethernet Switches

Compact PAC Products Catalog

- XP-8000-Atom Series
- XP-8000 Series
- WP-8000 Series
- LP-8000 Series
- iP-8000 Series
- ViewPAC Series
- MotionPAC Series
- I/O Expansion Units

Industrial CAN Bus Products Catalog

- CAN bus series
- CANopen series
- DeviceNet series
- J1939 series

Industrial Remote I/O Products Catalog

- RS-485 Remote I/O Modules
- Ethernet Remote I/O Modules
- FRnet I/O Modules
- CAN bus Remote I/O Modules
- PROFIBUS Remote I/O Modules

Industrial Wireless Communication Products Catalog

- Industrial Wireless series
- DSSS RF modems
- 2G/3G mini-PAC/Modules/Modems
- ZigBee converters & I/O modules
- GPS solutions

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