BiPOM Electronics, Inc.

Product Catalog

Issue 26

Your One Source for
Industrial Internet of Things

BiPOM Electronics, Inc.
Telephone: (713) 283 - 9970
E-mail: info@bipom.com
Web: www.bipom.com

WiPOM Supported Hardware

WiPOM on Peripheral Board

WiPOM on Cortex-M Embedded Board

WiPOM on Cortex-A Embedded Board

WiPOM on Cellular Board

WiPOM on Cellular Gateway

WiPOM on Cellular Modem

WiPOM on Embedded PC (Windows, Linux)
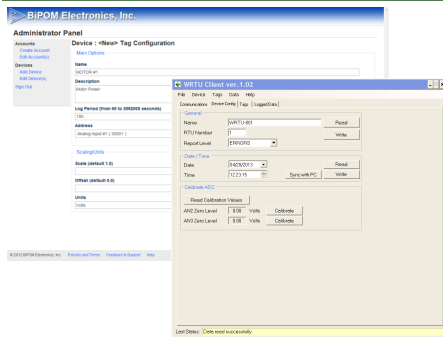
WiPOM on a Cortex Module

WiPOM on Cellular Module

WiPOM on a Cortex Chip

WiPOM Software

WiPOM Client Windows software communicates with WiPOM boards through USB:

- Configure device name, date/time, calibration
- Add / edit / delete tags
- Show logged data, events and alarms for selected time range
- Export collected data to Excel

Most of the WiPOM Client functions are also available from **WiPORTAL** below, accessing the field devices over the air from our web portal.

- Configure device name, date/time, calibration
- Add / edit / delete tags
- Collect data to database on server
- Export collected data to Excel

WiPORTAL

For customers who do not have an extensive IT Department yet need real-time remote data reporting and critical "Alerts", BiPOM offers **WiPORTAL**.

It is a simplified, low-cost, cloud/server service that provides timely and critical information 24/7. This service has been in operation for over five years. It is effective, reliable, low-cost and yet provides easy, password protected access, real-time data and immediate alerts with customer selected thresholds. Custom formats and alerts are provided to fit individual customer needs. If you have CloudGate, Sierra Wireless or other BiPOM wireless systems, this is immediately available. Please contact sales@bipom.com for signing up.
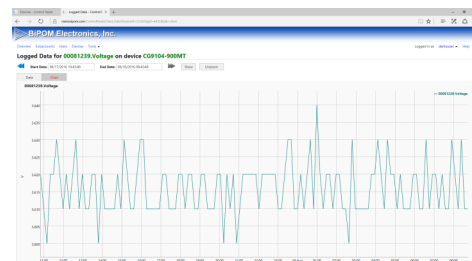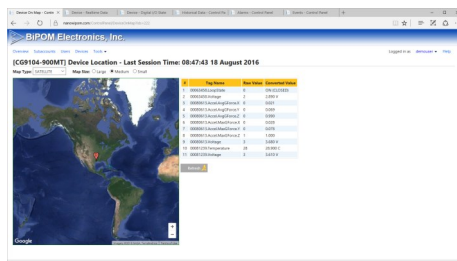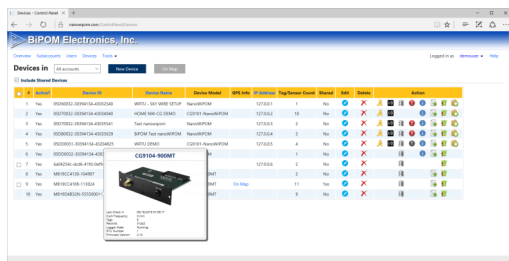
MODBUS Tools

MB Client is a MODBUS Master software for communicating with MODBUS Slave devices. **MB Client** and Built-in **MODBUS Simulator** supports MODBUS RTU and MODBUS TCP

- Unlimited number of registers
- Supports grouping of registers
- Support both MODBUS RTU and MODBUS TCP
- Coloring registers
- Different display formats - signed/unsigned, 16/32 bits, float/double formats
- Ability of adding units to every register
- Polls as a single read for efficiency
- MODBUS Simulator simulates unlimited devices, up to 1000 registers of each type

CloudGate Cellular Gateways

Cloudgate LTE delivers a faster, richer and smoother LAN to WWAN routing and GPS functionality in a single basic unit certified on all major USA cellular operators (LTE Bands 4/13/17 with 3G Fall back to HSPA+).
In addition CloudGate LTE is equipped with many new features: ignition sensing & timed wakeup - ideal for telematics and solar applications, expanded RAM, Flash and an SD memory slot - great for running more sophisticate applications on the CloudGate.
.

- High speed LTE
- Automatic connection monitoring and error recovery
- Secure, redundant firmware and configuration images
- Unique software and hardware configuration flexibility
- Automatic provisioning of custom middleware
- Expandable memory storage

CloudGate Rev3 Americas

CloudGate M2M Gateway Americas with Ethernet and Active GPS- LTE Bands 2/4/5/13/17 with 3G Fall back

CloudGate Micro

Industrial grade, cost-effective cellular connectivity.
20 LTE bands (EMEA, Americas, Asia) including TDD bands (China)

CloudGate Nano
LTE multiband IoT gateway providing internet connectivity at LTE Cat M1/ Cat NB1 data rates.

CloudGate Rev4 Worldwide

CloudGate LTE Worldwide (Rev 4) with Ethernet and active GPS. 20 LTE bands (EMEA, Americas, Asia) including TDD bands (China)

CloudGate Mini

CloudGate Mini bundle (CG Micro + IO expansion card). 20 LTE bands (EMEA, Americas, Asia) including TDD bands (China)

CloudGate Ethernet
The CloudGate Ethernet is an M2M gateway providing internet connectivity

Remote I/O Unit

METRIO is designed for distributed remote I/O connectivity. The METRIO can be connected to any Modbus-RTU master using RS485 wire, or using an optional wireless option card. Up to 12 I/O expansion boards can be installed onto the METRIO base carrier, for a flexible mix of I/O, and any of our over 40 peripheral boards.

Main Features
- Remote I/O expansion system
- Small form factor for mounting in your enclosure
- 12 to 30 VDC power input using on-board terminal blocks
- Connects to your Modbus-RTU master as a slave I/O unit
- RS485, 2-wire (direct connection using on-board terminal blocks)
- Long-range ZigBee wireless mesh radio (using a plug-in expansion card in slot 1), or 900 MHz radio module
- On-board slave node addressing switch • On-board LED's for communication and power status
- PC based application for configuring wireless node address, and setting up tag based Modbus-RTU registers
- Stack up to six optional expansion I/O boards in any combination
- DIN-Rail mounting housing included, tool-less installation

Optional Common Expansion Boards
- 8 analog Inputs (12 bit, 4-20 mA, or 0-5 VDC, strap selectable)
- 11 analog inputs (12 bit, 0-4.096 VDC) 1 analog output (10 bit)
- 8 analog outputs (10 bit)
- 8 Digital Inputs, opto-coupled, dry contact or voltage input, strap selectable
- 4 high current relay outputs
- 1 Thermocouple, with cold-junction compensation
- 12 Thermocouples, with cold-junction compensation
- Wireless (ZigBee, SiFlex)
- Custom designed expansion boards available on request

Uses: I/O expansion for RTU's, PLC's, PC's, any intelligent Modbus master, etc.
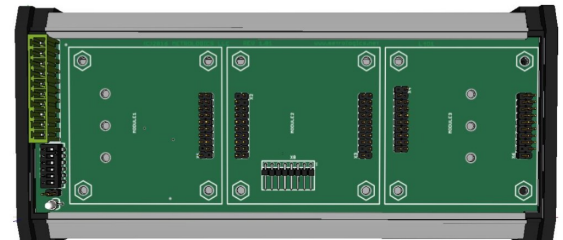
CloudGate Peripherals

Data Logger/RTU/PLC/IO
Coprocessor with RS232, RS485, 2 analog inputs, 4 digital inputs, 2 digital outputs, optional DIN-rail breakout terminal board, WiPOM inside.
CG9101-nanoWiPOM

ZigBee/Bluetooth
Cellular, GPS, Bluetooth, ZigBee and Wi-Fi all in one compact device.
CG9102-MultiWireless

Dual RS232, single USB, microSD
Two RS-232 and one USB Host/OTG expansion board with microSD socket.
CG9103-2RS232-1USB

Monnit™ ALTA
Connects low power Monnit™ sensors to cellular networks through CloudGate.
CG9104-900MT

SiFlex 900MHz Radio
Connects low power SiFlex™ wireless modules to cellular networks through CloudGate.
CG9105-SiFL

4 USB
The 4USB peripheralboard connects many off-the-shelf USB "gadgets" to CloudGate for building advanced remote monitoring systems
CG9106-4USB
.

Monnit™ ALTA Rear Slot
Option CloudGate Monnit ALTA 433, 868 and 900MHz Card rear slot.
CG2127-12144
CG2128-12145
CG2129-12148

LoraWan
The LoRaWAN base station expansion card for CloudGate. Connecting Lorawan Sensors to the Cloud.
CG2124-12129

WiFi
CloudGate WiFi Peripheral Card (WLAN Expansion / WLAN Access Point Card).
CG2101-11921
CG2102-11994

4-port Ethernet PoE
CloudGate 4-Port Ethernet Switch Peripheral Card, With Power over Ethernet (PoE).
CG1103-11935
.

4-port Ethernet non-PoE
CloudGate 4-Port Ethernet Switch Peripheral Card, Without Power over Ethernet (PoE).
CG1104-11936

1-port Ethernet
CloudGate 1-Port Ethernet Expansion Peripheral Card.
CG1109-11991

Telematics
CloudGate Telematics Expansion Card with I/O Daughter Board.
CG5106-11984
.

Single RS232
CloudGate RS232 Serial Port Peripheral Card.
CG1101-11919

Single RS232, single RS485
CloudGate RS232 and RS485 Serial Peripheral Card.
CG1102-11920

Smart Metering
The CloudGate expansion card that covers all your wired interface needs. Ideal for smart building, street cabinets & energy optimization.
CG1124-12154

Smart City
This card allows you to make a full-fledged Smart City Solution with your CloudGate Gateway.
CG1118-12064

KNX Interface
This Card provides the CloudGate with a TP1 interface to a KNX installation. It can also accept a range of Option or third party developed I/O expanders that match the card to specific applications.
CG1110-12012

Bluetooth Low Energy (BLE)
Option CloudGate BLE Card (nRF52), Bluetooth Low Energy Expansion Card, front slot.
CG1119-12096

Development Board
Development Peripheral Card.
CG1105-11937

Breadboard
CloudGate Breadboard Card.
CG1108-11980

Gateway Cables

120-140-1013:
Option CloudGate DC Power Cable (3 Meter)

1008649:
Option CloudGate AC Power Supply (US)

1008504:
Option CloudGate AC Power Supply (EU)

Cellular Modems

Skywire™ 4G LTE CAT 4 Embedded Modem

The latest Skywire 4G LTE Cat 4 embedded modem. This is the fastest and most cost-effective way to bring cellular connectivity to your IoT products. The CAT 4 modem delivers exceptional download and upload speeds and has Fallback to 3G.

NL-SW-LTE-TC4APG - Asia-Pacific Version
NL-SW-LTE-TC4NAG - North America Version
NL-SW-LTE-TC4EU - Europe Version

NL-SW-LTE-S7588

NimbeLink's® end-device-certified Skywire™ LTE CAT4 embedded modem is the fastest on Verizon, AT&T and T-Mobile cellular networks and perfect for high-bandwidth applications. This modem offers the same ultra-small size as Digi's XBee® Standard interface in the Skywire™ family. HSPA+ fallback is available on Verizon and AT&T.

NL-SW-LTE-S7648

The patented Skywire™ 4G LTE CAT 1 modem is end-device certified with PTCRB, FCC, IC and AT&T carrier certified which enables fast and cost-effective development. And, like all Skywire's, this modem is deigned to be easy to integrate and accelerate time to market.

NL-SW-HSPA

The Skywire™ Embedded 3G GSM modem is a member of the Skywire™ family of plug-in cellular products. With bands that support EMEA, N. America, S. America and Asia, this modem is a globally deployable 3G GSM modem. Supports HSPA+ and includes a Micro-SIM card slot that can accommodate Micro-SIM form factor SIM cards from any carrier.

BRD-mPCIe-SW

The BRD-mPCIe-SW full size mini PCI express adapter board adds cellular connectivity to any device with a mini-PCIe slot: Embedded PCs, laptops, industrial tablets or custom PC boards, without the cost and delay of obtaining FCC and carrier certifications. This adapter board accepts NimbeLink's NL-SW-LTE-S7588 certified Skywire™ cellular modem.

NL-AB-MPCIE

Mini-PCI Express Half Size adapter board for all Skywire products except NL-SW-HSPA. It is designed to let product developers easily add cellular connectivity to any device with a mini-PCIe slot-embedded PCs, laptops, or custom PC boards–without the cost and delay of obtaining FCC and carrier certification.

Skywire™ 4G LTE CAT 3 Embedded Modem

This Skywire 4G LTE CAT 3 modem leverages Category 3 technology and supports LTE, HSPA+, and UMTS communication, minimizing costs of hardware and network access. This modem delivers 100Mbps download and 50Mbps upload, and features a U.FL port for antenna flexibility.

NL-SW-LTE-TSVG-B - for Verizon
NL-SW-LTE-TNAG-B - for AT&T

NL-SW-LTE-GELS3-C

NimbeLink is expanding its award-winning Skywire family of cellular modems with the addition of a 4G LTE CAT 1 embedded modem. This new product is comparable in price and speed to 15 year-old 2G technology, but is specifically designed to bring 4G LTE capabilities to the Internet of Things (IoT) and machine-to-machine (M2M) applications.

NL-SW-LTE-S7618RD

The patented Skywire modem is end-device certified and enables the fastest and most cost-effective time to market. Created by a product company for product companies, which is available with bundled data plans from Verizon. The modem is targeted for the United States and uses the latest 4G LTE CAT1 technology.

BRD-mPCIe-X

The BRD-mPCIe-X full size mini PCI express adapter board adds cellular connectivity to any device with a mini-PCIe slot: Embedded PCs, laptops, industrial tablets or custom PC boards, without the cost and delay of obtaining FCC and carrier certifications. Accepts all the NimbeLink NL-SW series certified Skywire™ cellular modems (except the NL-SW-HSPA).

BRD-mPCIe-XB

Mini PCI Express to XBee interface board, USB

NL-SWN-LTE-NRF9160

The NL-SWN-LTE-NRF9160 offers LTE-M (CAT M1) and NB-IoT (NB1, NB2) connectivity for global applications, and also includes an integrated GPS/GNSS radio. This super small LTE M/NB-IoT embedded modem is packed with some big possibilities.

Skywire™ 4G LTE-M Global Embedded Modem

This new Skywire modem offers LTE-M (CAT M1) and NB-IoT (NB1, NB2) connectivity for global applications with fallback to 2G.

NL-SW-LTE-QBG95 - Quectel BG95 Embedded
NL-SW-LTE-QBG96 - Quectel BG96 Embedded

GL Series

The GL Series provides essential global connectivity to connect your products via a Serial or USB high speed interface. The small form factor makes it easy to integrate with products and because it has already been certified you can simply connect and begin sending and receiving data remotely.

GL8200	GL7500	GL7600
Global 3G HSPA: B1, B2, B5, B6, B8 DC 4.75V to 32V, 800 mA peak	EMEA 4G LTE Cat-1: B3, B8, B20 DC 4.75V to 32V, 600 mA peak	Americas 4G LTE Cat-4: B2, B4, B5, B13, B17 DC 4.75V to 32V, 800 mA peak

CELIA

CELIA series of products are cellular internet appliances with USB, or RS232 interface to a host computer. CELIA adds wireless connectivity to many devices such as embedded microcontroller boards, PLC's, industri-al equipment, instruments, PC's, PLC's, laptops and tablets — without the cost and delay of obtaining FCC and carrier certification. The board has a Nimbelink Skywire™ LTE CAT4 cellular modem module with up to 150 Mbit/second in downlink, 50 Mbit/second in uplink. The small form factor fits easily in many enclosures, instruments panels and devices.

● Compact, extruded aluminum enclosure with flanges for mounting
● Plug-and-play operation with Linux, Windows 7,8,10 and Embedded
● Customer can use any antenna without requiring re-certificatio

Sierra Wireless Airlink Cellular Gateways

ES450

The Airlink® ES450 is a reliable, secure LTE (4G) Enterprise Gateway & Terminal Server with Ethernet/Serial/USB.

Voltage: 9 to 36 VDC, Low Power mode triggerable upon low voltage, timer delay (ignition sense), periodic timer.

Supported Bands:
- LTE: B2, B4, B5, B13, B17, B25
- WCDMA: B1, B2, B4, B5, B8
- EV-DO/CDMA: BC0, BC1, BC10
- GSM/GPRS/EDGE: Quad-band

RV50/RV50X

AirLink® RV50 is the industry's lowest power and most rugged LTE gateway.
RV50X supports an extensive range of LTE bands worldwide, and delivering up to 300 Mbps downlink speeds.

RV50 (North America)	RV50 (International)	RV50X (North America & EMEA)	RV50X (Asia Pacific)
LTE CAT3: B2,B4,B5,B13,B17,B25 HSPA/HSPA+: B1,B2,B4,B5,B8 CDMA 1X/EV-DO: B1,B2,B4,B5,B8 EDGE/GSM/GPRS: Quad-band	LTE CAT3: B1,B3,B7,B8,B20 HSPA/HSPA+: B1,B2,B5,B8 EDGE/GSM/GPRS: Quad-band	LTE CAT 6: B1,B2,B3,B4,B5,B7,B8,B12,B13,B20,B25,B26,B29, TDD B41 HSPA/HSPA+: B1,B2,B3,B4,B5,B8	LTE CAT 6: B1,B3,B5,B7,B8,B18,B19,B21,B28, TDD38,TDD39,TDD40,TDD41 HSPA/HSPA+: B1,B5,B6,B8,B9,B19 TD-SCDMA: B39

Input Voltage: 7 to 36 VDC, **LTE Idle Power**: 900mW (75 mA @ 12VDC), **Standby Mode Power**: 53 mW (4.4 mA @ 12 VDC) triggered on low voltage, I/O or periodic timer

GX450

AirLink GX450 Rugged, Mobile 4G XLTE Gateway with Ethernet/Serial/USB/GPS,
Ideal for in-vehicle field deployments in law enforcement, fire, EMS, utilities, commercial fleets and taxis.

GX450 WiFi	GX450 I/O	GX450 Multi-Ethernet
GX450 4G XLTE Gateway + WiFi	GX450 4G XLTE Gateway + I/O ports	GX450 4G XLTE Gateway + Multi-Ethernet

	North American Model	International Model
Supported Bands	- LTE: 1900(B2), AWS(B4), 850(B5), 700(B13), 700(B17),1900(B25) - WCDMA: 2100(B1), 1900(B2), AWS(B4), 850(B5), 900(B8) - EV-DO/CDMA: 800(BC0), 1900(BC1), 1700(BC10) - GSM/GPRS/EDGE: Quad-band	- LTE: 2100(B1), 1800(B3), 2600(B7), 900(B8), 800(B20) - WCDMA: 2100(B1), 1900(B2), 850(B5), 900(B8) - GSM/GPRS/EDGE: Quad-band
POWER	Input Voltage: 9 to 36 VDC, Low Power mode triggered on low voltage, timer delay (ignition sense), or periodic timer	

MP70

AirLink® High performance, LTE-Advanced vehicle router.

- Offers high performance vehicle area network (VAN)
- Provides connected vehicle awareness
- Purpose built for vehicles
- Provides secure intelligent communications
- Network management in the cloud or in the enterprise data center

MG90

AirLink® High Performance Multi-Network Vehicle Router.

- Selects best available network based on user-defined policies
- Seamless network handover and sub-second network switching
- Consolidated security with the AirLink® Connection Manager
- Remote, real-time network insight and control with the Mobility Manager
- Purpose built for vehicles

United States	North America & EMEA	Asia Pacific
LTE CAT3: B2,B4,B5,B13,B17,B25 **WCDMA/HSPA+/EVDO**: B1,B2,B4,B5,B8 **EVDO**: BC0, BC1, BC10 **EDGE/GSM/GPRS**: Quad-band **CDMA**: BC0, BC1, BC10	**LTE CAT6**: B1,B2,B3,B4,B5,B7,B8,B12,B13,B20,B25,B26,B29,TDD B41 **WCDMA/HSPA+/EVDO**: B1,B2,B3,B4,B5,B8	**LTE CAT 6**: B1,B3,B5,B7,B8,B18,B19,B21,B28,TDD38,TDD39,TDD40,TDD41 **WCDMA/HSPA+/EVDO**: B1,B5,B6,B8,B9,B19 **TD-SCDMA**: B39

Operating Voltage: 7 to 36 VDC. (Low voltage disconnect to prevent battery drain)

United States	North America & EMEA	Asia Pacific
LTE CAT3: B2,B4,B5,B13,B17,B25 **WCDMA/HSPA+/EVDO**: B1,B2,B4,B5,B8 **EVDO**: BC0, BC1, BC10 **CDMA 1X/EV-DO**: B1,B2,B4,B5,B8 **EDGE/GSM/GPRS**: Quad-band **CDMA**: BC0, BC1, BC10	**LTE CAT6**: B1,B2,B3,B4,B5,B7,B8,B12,B13,B20,B25,B26,B29,TDD B41 **WCDMA/HSPA+/EVDO**: B1,B2,B3,B4,B5,B8	**LTE CAT 6**: B1,B3,B5,B7,B8,B18,B19,B21,B28,TDD38,TDD39,TDD40,TDD41 **WCDMA/HSPA+/EVDO**: B1,B5,B6,B8,B9,B19 **TD-SCDMA**: B39

Operating Voltage: 7 to 36 VDC. **Power modes**: ON 30W (2.5A @12V); Standby 135mW (11mA@12V)

FX30 Series

The FX30 is the industry's smallest, most rugged programmable 3G/4G LTE cellular gateway. Providing an integrated, secure embedded application environment, tightly integrated with the cloud, the FX30 enables swift, scalable and global deployments of IoT applications for any connected machine or infrastructure.

POWER CONSUMPTION
- Ignition Off: 400 μW (65μW at 5V)
- Ultra Low Power Mode: 2 mW
- Idle mode <1W
- GSM/GPRS max 2.6W, GSM burst 7.2W (USB at 70Mbps and Ethernet at 55 Mbps)
- WCDMA/HSDPA/HSUPA max 3.3W (USB at 70Mbps and Ethernet at 55 Mbps

	FX30	FX30S Serial	FX30 LTE Americas Verizon	FX30 LTE Americas AT&T, T-Mobile
AIR INTERFACE	HSPA+ / EDGE / GSM / GPRS	HSPA+ / EDGE / GSM / GPRS	LTE Cat-M1	LTE Cat-M1 3G UMTS/HSPA+
FREQUENCY BANDS	3G: B1 / B2 / B5 / B6 / B8 / B19 2G: 850 / 900 / 1800 / 1900	3G: B1 / B2 / B5 / B6 / B8 / B19 2G: 850 / 900 / 1800 / 1900	Cat-M1: B4 / B13	Cat-M1: B2 / B4 / B5 / B12 3G: B2 / B4 / B5
VOLTAGE	DC 4.75V to 32V			

LX40

AirLink® most compact LTE and LTE-M / NB-IoT router.

- Most compact LTE router in its class supporting 150Mbps/50Mbps
- Power-over-Ethernet , ideal for fixed low power applications
- LTE and LTE-M/NB-IoT variants for global deployments
- Remote, secure network management in the cloud or in the enterprise
- Supports edge processing and IoT applications with ALEOS Application Framework (AAF)

APPROVED CARRIERS	MAX SPEEDS (DL/UL Mbps)	WI-FI	HOST INTERFACE
Verizon, AT&T	LTE: 150/50 LTE-M: 300kbps/375kbps NB-IoT: 27kbps/65kbps	2.4/5GHz (Optional) 802.11b/g/n/ac 1x1 SISO 1 SSID	1 Ethernet (10/100/1000) 1 USB 2.0 (Micro) 1 GPIO PoE - Powered Device

Operating Voltage: 7-36VDC, PoE - Powered Device

LX60

AirLink® first industrial LTE and LTE-M / NB-IoT router.

- Dual Gigabit Ethernet, RS-232, RS-485 and multiple I/O
- Remote, secure network management in the cloud or in the enterprise
- LTE and Global LTE-M/NB-IoT variants provide excellent cellular performance for IoT and machine applications for global deployments
- Supports edge processing and IoT applications with ALEOS Application Framework (AAF)

APPROVED CARRIERS	MAX SPEEDS (DL/UL Mbps)	WI-FI	HOST INTERFACE
Verizon, AT&T	LTE: 150/50 LTE-M: 300kbps/375kbps NB-IoT: 27kbps/65kbps	2.4/5GHz (Optional) 802.11b/g/n/ac 1x1 SISO 1 SSID	2 Ethernet (10/100/1000) 1 Serial (RS232/485) 1 USB 2.0 (micro) 5 GPIO

Operating Voltage: 7-36VDC

Monnit® Gateways

ALTA Serial MODBUS Gateway

Monnit® Serial MODBUS Gateway acts as a data concentrator for Monnit® wireless sensor networks.incorporates Monnit's APN and Serial RS-232C and RS-485 Interfacing hardware

MNG2-9-SG-SMG	MNG2-8-SG-SMG	MNG2-4-SG-SMG	MNG2-91-SG-SMG
900 MHz	868 MHz	433 MHz	920 MHz Korea

ALTA Ethernet Gateway 4

Monnit's Ethernet Gateways allow your Monnit® Wireless Sensors to communicate with the iMonnit™ Online Wireless Sensor Monitoring and Notification System without the need for a PC.

MNG2-9-EGW-CCE MNG2-9-EGW-CCE-POE	MNG2-8-EGW-CCE MNG2-8-EGW-CCE-POE	MNG2-4-EGW-CCE MNG2-4-EGW-CCE-POE
900 MHz	868 MHz	433 MHz

Monnit® ALTA Wireless Sensors

ALTA sensors offer 3 to 4 times the range of standard sensor platforms, extending non-line-of-sight reach to an exceptional 1,200+ feet through walls (12-14 walls typical). Using Frequency-hopping Spread Spectrum (FHSS) also allows ALTA sensors to have better interference immunity from other wireless devices. Superior power management provides ALTA sensors with almost twice the battery life of Monnit's standard wireless sensors.

- Coin cell sensors (-W1 option) typically last 3+ years.
- AA (-W2 option) and Industrial (-IN option) sensors typically last up to 12+ years.

ALTA products employ Monnit's new Encrypt-RF® Security (256-bit Diffie Hellman key exchange and AES-128 CBC encryption for all sensor data messages), so security is maintained at all communication points from sensor to gateway, gateway to software, then back again.
Integrated on-board data storage allows ALTA sensors to store data messages if communication to a wireless gateway is disrupted (power outage, Internet

Button Press Sensor allows a notification signal to be sent when immediate contact is important. This button includes an LED response indicator to confirm that the system has received the alert.

MNS2-9-W1-PB-ST MNS2-9-W2-PB-ST	MNS2-8-W1-PB-ST MNS2-8-W2-PB-ST	MNS2-4-W2-PB-ST
900 MHz	868 MHz	433 MHz

Temperature Sensor use a thermistor to accurately measure temperatures. These sensors are perfect for monitoring ambient temperatures around the sensors physical location. User customization allows you to set the frequency of readings and the ability to set thresholds for alerts via SMS text and/or email. NIST certified product is available

MNS2-9-W1-TS-ST MNS2-9-W2-TS-ST	MNS2-8-W1-TS-ST MNS2-8-W2-TS-ST	MNS2-4-W1-TS-ST MNS2-4-W2-TS-ST
900 MHz	868 MHz	433 MHz

Humidity sensor allow you to monitor the relative humidity of the air within a room or enclosure. Ideal for monitoring humidity within greenhouses, industrial spaces, museums, saunas and humidors. They can also be used for residential applications such as controlling mold, mildew or dust

MNS2-9-W1-HU-RH MNS2-9-W2-HU-RH	MNS2-8-W1-HU-RH MNS2-8-W2-HU-RH	MNS2-4-W1-HU-RH MNS2-4-W2-HU-RH
900 MHz	868 MHz	433 MHz

Differential Air Pressure Sensor measures the pressure difference between two input ports and transmits the measurement to iMonnit.

MNS2-9-W2-PS-DP-LPO	MNS2-8-W2-PS-DP-LPO	MNS2-4-W2-PS-DP-LPO
900 MHz	868 MHz	433 MHz

Air Speed Sensor measures the pressure difference between two input ports, the temperature, and altitude determines the speed at which the air is moving in a system and transmits the measurement to iMonnit.

MNS2-9-W2-PS-AV-LPO	MNS2-8-W2-PS-AV-LPO	MNS2-4-W2-PS-AV-LPO
900 MHz	868 MHz	433 MHz

Voltage Meter are capable of measuring the voltage off another device, battery, or sensor. Examples of interfacing devices include, but are not limited to: Strain Gauge, Pressure Transducer, RTD, Thermistor, or Thermocouple, Piezo Electric sensors, Photoresistor, Industrial Accelerometer, any kind of variable resistor, any kind of sensor that outputs a voltage, etc.

0-5 VDC	MNS2-9-W1-VM-005,MNS2-8-W1-VM-005 MNS2-9-W2-VM-005,MNS2-8-W2-VM-005,MNS2-4-W2-VM-005
0-10 VDC	MNS2-9-W1-VM-010,MNS2-8-W1-VM-010
0-200 VDC	MNS2-9-W2-VM-200,MNS2-8-W2-VM-200,MNS2-4-W2-VM-200
500 VAC/VDC	MNS2-9-W1-VM-500,MNS-8-W1-VM-500 MNS2-9-W2-VM-500,MNS-8-W2-VM-500,MNS-4-W2-VM-500, MNS-91-W2-VM-500

Voltage Detector detects the presence or absence of electricity.

500 VAC	MNS2-9-W1-VD-AC,MNS2-8-W1-VD-AC MNS2-9-W2-VD-AC,MNS2-8-W2-VD-AC,MNS2-4-W2-VD-AC
200 VDC	MNS2-9-W1-VD-200,MNS2-8-W1-VD-200 MNS2-9-W2-VD-200,MNS2-8-W2-VD-200,MNS2-4-W2-VD-200

Ultrasonic Sensor can be used in a variety of applications for measuring distances between the sensor and objects in its path. ALTA ultrasonic sensors are impervious to target surface and color, and feature auto-calibration algorithms which allow them to adapt to variable environmental

MNS2-9-W2-US-ST	MNS2-8-W2-US-ST	MNS2-4-W2-US-ST
900 MHz	868 MHz	433 MHz

Open/Closed Sensor provide information on the status of doors, windows, cabinets, etc. Know if a building or area is being accessed when it should not be, or if a door or window has been left open. Alerts can be setup to notify a user by SMS text, email or voice call.

MNS2-9-W1-OC-ST MNS2-9-W2-OC-ST	MNS2-8-W1-OC-ST MNS2-8-W2-OC-ST	MNS2-4-W2-OC-ST
900 MHz	868 MHz	433 MHz

Monnit® ALTA Wireless Sensors

Carbon Monoxide (CO) Sensor
allows you to monitor the level of carbon monoxide (CO) gas in the surrounding air. It has a small footprint and low cost but boast industry leading, premium performance specifications and are the longest lifetime sensors in the industry and the only CO sensor on the market powered by a coin cell battery.

MNS2-9-W2-GS-C1,MNS2-8-W2-GS-C1,MNS2-4-W2-GS-C1,MNS2-91-W2-GS-C1

Hydrogen Sulfide (H2S) Gas Sensor
allows you to monitor the level of Hydrogen Sulfide (H2S)
- Measuring Range 0-50 PPM
- Measuring Principle Electrochemical reaction of H2S
- Resolution ± 0.1 PPM

MNS2-9-W2-GS-H2S,MNS2-8-W2-GS-H2S,MNS2-4-W2-GS-H2S

Air Quality – PM Meter
measures PM1, PM2.5 and PM10 concentrations in the air and transmits the measurement to iMonnit. The PM2.5 meter works by turning on a small fan at the beginning of a measurement cycle to bring in a volume of ambient air and measuring the particulate matter (PM) content of that sample volume.

MNS2-9-W2-AQ-P25A-LPO,MNS2-8-W2-AQ-P25A-LPO,MNS2-4-W2-AQ-P25A-LPO

Accelerometer
can be used in a host of applications where knowing impact, vibration, inclination, etc. is required..

Accelerometer - Tilt	MNS2-9-W1-AC-TL, MNS2-8-W1-AC-TL MNS2-9-W2-AC-TL, MNS2-8-W2-AC-TL,MNS2-4-W2-AC-TL
Accelerometer - Impact Detection	MNS2-9-W1-AC-IM, MNS2-8-W1-AC-IM MNS2-9-W2-AC-IM, MNS2-8-W2-AC-IM, MNS2-4-W2-AC-IM
Accelerometer - G-Force Snapshot	MNS2-9-W1-AC-GS,MNS2-8-AC-W1-AC-GS MNS2-9-AC-W2-AC-GS,MNS2-8-AC-W2-AC-GS, MNS2-4-AC-W2-AC-GS

Accelerometer - Vibration Meter
is designed to measure continuous vibration and be low powered so it captures vibration for less than a second during its Measurement Interval.

MNS2-9-W2-AC-VM	MNS2-8-W2-AC-VM	MNS2-4-W2-AC-VM
900 MHz	868 MHz	433 MHz

Accelerometer - Advanced Vibration Meter
reports vibration (acceleration, velocity, displacement, or acceleration peak), frequency (Hz/RPM), and crest factor on all three axes. It also reports duty cycle and temperature.

MNS2-9-W2-AC-ADV	MNS2-8-W2-AC-ADV	MNS2-4-W2-AC-ADV
900 MHz	868 MHz	433 MHz

Light Meter
measures the intensity of light in lux (luminescence/unit area), from 0 - 1000 lux.

MNS2-9-W2-LS-LM	MNS2-8-W2-LS-LM	MNS2-4-W2-LS-LM
900 MHz	868 MHz	433 MHz

Pressure Meter
measure pressure from a 5 volt pressure transducer and transmits the pressure measurement to iMonnit.

50 PSIG	MNS2-9-W2-PS-050,MNS2-8-W2-PS-050,MNS2-4-W2-PS-050

Activity Detection Sensor
can be used to detect vibration, or sudden movement etc.

MNS2-9-W1-MV-VD MNS2-9-W2-MV-VD	MNS2-8-W1-MV-VD MNS2-8-W2-MV-VD	MNS2-4-W2-MV-VD
900 MHz	868 MHz	433 MHz

Water Rope Sensor
detects conductive liquids anywhere along the length of the detection rope by using two wires covered with conducting polymer. When water or conductive liquid contacts the rope, the sensor will immediately turn on the RF radio and transmit the data to the wireless gateway and iMonnit Online Sensor Monitoring and Notification System.

MNS2-9-W1-WS-WR MNS2-9-W2-WS-WR	MNS2-8-W1-WS-WR MNS2-8-W2-WS-WR	MNS2-4-W2-WS-WR
900 MHz	868 MHz	433 MHz

Water Detect Sensor
alert you via SMS text and/or email when there is water detected, preventing potential property damage that results from flooding or leaks. This sensor can also be used to detect a lack of water, allowing you to know when a container is nearing empty.

MNS2-9-W1-WS-WD-L03 MNS2-9-W2-WS-WD-L03	MNS2-8-W1-WS-WD-L03 MNS2-8-W2-WS-WD-L03	MNS2-4-W2-WS-WD-L03
900 MHz	868 MHz	433 MHz

Infrared Motion Sensor
use an infrared sensing technology to accurately detect movements made by people/animals within 16.4 ft (5 m) range. User customization allows you to receive notifications by SMS text or email the instant motion is detected.

MNS2-9-W1-MS-IR MNS2-9-W2-MS-IR	MNS2-8-W1-MS-IR MNS2-8-W2-MS-IR	MNS2-4-W2-MS-IR
900 MHz	868 MHz	433 MHz

Dry Contact Sensor
can be used to detect contact between two wired contact points. This sensor can be used with an external mechanical switch or a contact plate to alert the user via SMS text and/or email when the contacts touch or a switch is triggered.

MNS2-9-W1-DC-CF-L01 MNS2-9-W2-DC-CF-L01	MNS2-8-W1-DC-CF-L01 MNS2-8-W2-DC-CF-L01	MNS2-4-W2-DC-CF-L01
900 MHz	868 MHz	433 MHz

AC Current Meter
measure the RMS current of an alternating current (AC) system using a current transformer (CT)

20 Amp	MNS2-9-W2-CM-020,MNS2-8-W2-CM-020,MNS2-4-W2-CM-020
150 Amp	MNS2-9-W2-CM-150,MNS2-8-W2-CM-150,MNS2-4-W2-CM-150
500 Amp	MNS2-9-W2-CM-500,MNS2-8-W2-CM-500,MNS2-4-W2-CM-500

0-20 mA Current Meter
are capable of measuring the current off another device or sensor, up to 20mA (DC).

MNS2-9-W1-MA-020 MNS2-9-W2-MA-020	MNS2-8-W1-MA-020 MNS2-8-W2-MA-020	MNS2-4-W2-MA-020
900 MHz	868 MHz	433 MHz

Pulse Counter
can be integrated with up to four, dry contact or mechanical switch and closure devices to count the number of actuations occurring within a given time frame for each input.

MNS2-9-W1-PC-01 MNS2-9-W2-PC-01	MNS2-8-W1-PC-01 MNS2-8-W2-PC-01	MNS2-4-W2-PC-01
900 MHz	868 MHz	433 MHz

ALTA Industrial Wireless Sensors
come in an IP65, NEMA 4X, CE rated, sealed, and weatherproof enclosure. They are powered by a single, replaceable, Industrial grade 3.6 V battery. An optional solar powered version is also available.

Monnit Wi-Fi Sensors
come in with an integrated 802.11 b/g radio transmitter that can be easily programmed to work with any existing Wi-Fi network.

## IIoT platforms

nanoWiPOM is a miniature wireless remote monitoring computer. Taking advantage of cellular networks, nanoWiPOM allow remote monitoring of voltages, currents, frequencies and many other physical parameters.

- Preinstalled WiPOM firmware with tag support, alarms, event and data logger, communications support
- Based on the Cortex™-M7 microcontroller
- LTE modem support
- One USB device port, one RS485 serial port, two RS232 serial ports
- Analog input terminals (2 x 4-20mA or 0-6V jumper selectable)
- Digital input terminals (4 x dry contacts or voltage inputs)
- Digital output terminals (2 x 0.5A)
- Battery for real-time clock
- 10-30 Volt input power range
- Web Portal allows remote data access and tag configuration
- Windows based WiPOM Client allows data upload and tag configuration

- 32MB DataFlash
- microSD holder (option)
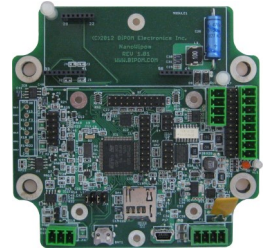
mangOH Red is the smallest hardware platform that enables new low-power IoT applications. The industrial-grade reference design offers a revolutionary most power-efficient to achieve 10 years of battery life. It's built with the capabilities that the industrial maker community need for collecting and sending IoT sensor data to the cloud.

- Credit card size form-factor ideal for rapidly building proof-of-concepts
- A snap-in socket to add any CF3™ - compatible modules, including wireless modules (2G to 4G & LTE-M/NB-IoT) to achieve up to 10 years of battery life
- An IoT Expansion Card slot to plug in any technology based on the IoT Expansion Card open standard
- An Integrated Sierra Wireless Smart SIM with up to 100 MB free data, depending on region, and can also be used with any commercially available SIM
- Integrated with the AirVantage IoT platform to create, deploy and manage solutions in the cloud
- The Cortex-M4 processor runs real-time operating system
- Built-in Accelerometer/Gyroscope, Pressure and Light sensors
- Built-in audio jack allows mangOH Red to make two-way voice calls
- Simply connect the board to a console via USB connector
- Offers a microSD slot for easy off-line updates and storage
- Board can operate on single cell Lithium polymer, DC power supply or USB. There is a battery charger for charging the battery as well

- Built-in Wi-Fi b/g/n and Bluetooth 4.2 BLE
- 26-pin Raspberry Pi-compatible connector
- Integrated Cloud Services
- Open Source Linux

mangOH Green is the first hardware platform that enables rapid prototyping and faster time-to-market of new IoT applications. The industrial-grade reference design offers unprecedented flexibility and expandability for collecting and sending IoT sensor data to the cloud.

- Connects to any 2G, 3G or 4G LTE mobile networks in the world with the CF3 based wireless modules from Sierra Wireless
- SIM Card slot allows you to utilize Smart SIM card and its Connectivity Service that delivers multi-operator coverage, superior data service quality, and resilience to outages
- 3 X IoT Expansion Card Connectors let you add any combination of wired, wireless and sensor technologies to your board
- With serial and ethernet connectivity built-in, you can develop wired and wireless products without any expertise in connecting to mobile or pan networks
- Built-in audio jack allows mangOH Red to make two-way voice calls
- Simply connect the board to a console via USB connector
- Offers a microSD slot for easy off-line updates and storage
- Board can operate on single cell Lithium polymer, DC power supply or USB. There is a battery charger for charging the battery as well
- You can plug in any Arduino Shields to the board to add hundreds of expansion possibilities

- Standard Eurocard or Custom 3D Case
- Integrated Cloud Services
- Open Source Linux
- Equipped with an accelerometer and gyroscope

mangOH Yellow introducing the super smart edge open source solution for IoT. Smaller than a credit card yet jam-packed with super sensors, mangOH Yellow connects your devices to any LTE-M and NB-IoT networks in the world, reducing cost, lowering power consumption, while extending coverage and expanding capacity.

- Compact form-factor you could build on, test, or even take any IoT application to market including small tracking devices
- A snap-in socket to add any CF3-compatible modules, including wireless modules (2G to 4G & LTE-M/NB-IoT, GPS) to achieve up to 10 years of battery life
- Built-in Accelerometer, Gyroscope, Magnetometer, Pressure, Humidity, Acoustic mic, Air Index quality, temperature, and Light sensors
- An IoT Expansion Card slot to plug in any technology based on the IoT Expansion Card open standard
- Robust connectivity APIs lets you access cloud and network services such as voice calls, SMS, data, radio controls
- Maintained Linux distribution based on the long-term supported Linux kernel (LTSI) hosted by the Linux Foundation
- Includes a cellular modem for wirelessly connecting your IoT applications over a mobile network
- Built-in Wi-Fi b/g/n and Bluetooth 4.2 BLE , Bluetooth Mesh, NFC tag
- Built-in antennas for cellular, GPS, WiFi, Bluetooth and NFC
- 15 pin IO expansion connector, SD card, 2-way audio connector
- Cloud and connectivity provided for Octave (3 months free usage)
- Powerful ARM-based application processor with GNSS receiver
- Can be powered by a battery for low-power wireless applications
- Octave platform from Sierra Wireless (3 months subscription included)
- Pre-integrated with the open source Legato Linux platform for application-level development

- Multiple LEDs , buzzer and touch button
- Battery charger and battery gauge
- 3D-printable case designs available
- 100 MB of data with Sierra Wireless Smart SIM
- Connect to your cloud infrastructure
- Built-in sensors including Accelerometer, and Gyroscope
- Device and SIM management provided through AirVantage
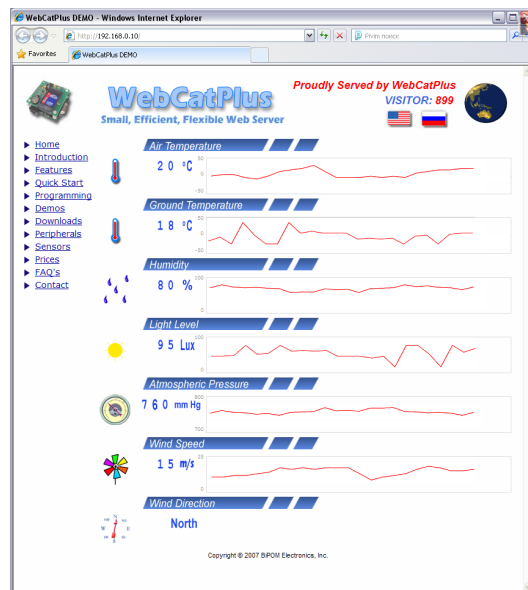
WebCatPlus Web Server

WebCatPlus, one of the world's smallest web servers. Occupying only 2.4" by 2.35" footprint and consuming under 110mA of current, WebCatPlus can operate from a small wall adapter or even batteries, yet allow you to monitor your data and control operations from around the world.

Combined with a large selection of peripheral boards from BiPOM Electronics, WebCatPlus packs versatility and power into a truly small form factor.

Turn relays on and off, rotate and tilt cameras, display alarms on LCD and VFD displays, reboot/reset PC's, activate robotic arms, watch motor speed, log temperature and humidity, display pressure and thousands of other real-world, real-time control and monitoring applications are possible.

No more need for dedicated, power-hungry PC's or expensive embedded processor boards for simple to complex web-based monitoring and control.

All this is now possible without a single line of programming. WebCatPlus comes pre-loaded with a web server application that can read PC file format. Simply generate your HTML's with your favorite editor (for example, FrontPage, Dreamweaver, etc.), insert tags to monitor data from real hardware, insert commands to control real hardware and you are ready to monitor and control the world.

WebCatPlus Web Server is not limited to HTML pages. All client side scripting languages, such as Java applets, Java scripts, VB Scripts are supported.

Memory size of the web site is limited by the MMC size. It is possible to have megabytes (even Gigabytes !!!) of web pages.

WebCatPlus Web Server Features :

- Based on BiPOM's MINI-MAX/ARM-E board
- 32-bit ARM7 microcontroller (LPC2138, 58.9824 MHz)
- Second 8-bit AVR® CPU (ATTINY2313,8 MHz)
- 512K Flash, 32K RAM, 1MB DataFlash
- Expansion bus interface to low-cost peripheral boards
- JTAG programming interface
- LCD connector (programmable contrast adjustment for the LCD)
- 10MBit (10Base-T) Ethernet port (ENC28J60)
- Current consumption 110 mA
- Dimensions: 2.4" x 2.35" x 1.2"
- 31 Digital I/O's
- Two RS-232 Serial ports, I2C (2-wire) bus
- Watchdog Timer
- In-system programmer to upload WEB server firmware
- 6-12VDC power supply
- Real Time Clock with Lithium battery backup option
- FAT12/FAT16/FAT32, long name support
- ARP,ICMP,IP,TCP,HTTP stack
- Online Demo available at www.bipom.com/wc.php

Additional modules (peripheral boards and sensors):

- Analog to digital converters
- Digital to analog converters
- Additional data storage
- 7- segment LED displays
- Opto-isolated input board
- I/O expander board
- Motor controller boards
- Thermocouple inputs
- Various digital sensors to measure temperature, humidity and others

Product	Base Board	Speed	Storage	Specifics
WebCatPlus	MINI-MAX/ARM-E	Slow	Smallest	Files served from serial EEPROM. Low cost.
WebCatPlus-MMC-1	MINI-MAX/ARM-E	Medium	Large	Files served from MultiMediaCard (MMC).

Data Plans

BiPOM is an authorized reseller for T-Mobile, Verizon and Sierra Smart SIM M2M Business Plans.

Cellular LTE Rate Plans (SIM-based) :

Verizon Plans

- Plans are pooled.
- Plans come with a static IP. Static IP's are public and do not require a VPN connection.
- Contact BiPOM for a VPN arrangement.
- APN = **vzwinternet** for dynamic IP plans
- APN = **so01.vzwstatic** for static IP plans
- All SIM cards can be configured either as dynamic or static IP.
- All SIM cards support SMS

Monthly Limit	
1MB	100MB
5MB	250MB
10MB	500MB
20MB	1GB
50MB	2GB

Sierra Wireless Smart SIM

The Sierra Wireless Smart SIM and Connectivity Service deliver multi-operator coverage, superior data service quality, and resilience to outages, whether your application is global, regional or local. It is also one of the first to support the new GSMA eSIM/eUICC specification for remote operator provisioning critical to many new IoT use cases.

- Multi-operator connectivity
- Smart network selection
- Resilient to outages
- Global or regional plans
- eSIM/eUICC ready
- Managed by our AirVantage IoT Platform

Sensors

VTB-Sensor/VTB-RS485 Sensor is addressable with a smart programmable design enabling reliability engineers and maintenance professionals to have a one-size-fits-all vibration sensor for both critical and non-critical balance of plant machines. The VTB-Sensor is suitable for rotating machine applications such as motors, pumps, fans, compressors, engines, centrifuges, cooling towers as well as reciprocating machines such as compressors and pumps. The sensor provides overall vibration level outputs for the X, Y and Z axis in acceleration, and velocity as well as provides a temperature output. It has programmable low-pass, high-pass or band-pass filter capability. The VTB-Sensor also takes user-defined periodic snapshots of the dynamic vibration information for real-time automated machine condition analysis. VTB-Sensor "All in one Sensor" includes:

- 3 (X, Y, Z) axis high frequency vibration sensors
- 3 (X, Y, Z) axis low frequency vibration sensors
- 1 RTD temperature sensor
- Smart addressable microprocessor for onboard signal conditioning
- Outputs in acceleration, velocity, displacement or impact to detect looseness
- User-defined dynamic signal "snapshot" for condition monitoring
- Programmable filters (high, low and band-pass)
- Automatic calibration verification, diagnostics
- Universal mounting, any axis any orientation

- Multi-color sensor status LED
- Wide operating temperature range -40°C to +105°C
- Frequency response: 0.4 Hz to 1,000Hz (standard), .04Hz to 5,000 Hz (option)
- Small compact enclosure 2.0" X 2.0" X 1.25" (51mm X 51mm X 32mm)
- ¼-28 UNF mounting studs, ½"NPT flex conduit connection ready

Antennas and Accessories

Internal Antennas:

— Adhesive Mount —

2JP0524P-UFL-150MM :
Cellular Strip Antenna - Rigid - Black - 150mm cable - u.FL

2JP0624P-UFL-150MM :
Cellular Strip Antenna - Rigid - Black - 150mm cable - u.FL

2JF0924P-UFL-150MM :
Cellular Strip Antenna - Flexible - Black - 150mm cable - u.FL

2JF0424P-UFL-150MM :
Cellular Strip Antenna - Flexible - Black - 150mm cable - u.FL

2JF0624P-UFL-150MM:
Cellular Strip Antenna - Flexible - Black - 150mm cable - u.FL

2JF0101P-UFL-150MM :
GNSS Strip Antenna - Flexible - Black - 150mm cable - u.FL

2JP0102P-013MC081-MHF4_GETUSA :
Cellular Strip Antenna - Flexible - Black - 100mm cable - MHF4

— Surface Mount —

2JS20 :
Cellular Ceramic Patch Antenna

2JE18 :
Cellular Fiberglass Brick Antenna

2JE20 :
Cellular Ceramic Brick Antenna

2JS10 :
GPS Ceramic Patch Antenna

— Thru-Hole Mount —

2JCP2540101GA :
2J Antennas - GPS/GLO Ceramic Patch Antenna - Thru-Hole

2JCP1840101GA :
2J Antennas - GPS/GLO Ceramic Patch Antenna - Thru-Hole

External Antennas:

— External - Connector Mount —

2JW1124-BL-SM :
Blade Antenna - Cellular - Black - SMA

2J0115-868-C109N :
Stub Antenna - 868 MHz - Black - SMA
2J0115-915-C109N :
Stub Antenna - 915 MHz– Black - SMA

2JW1024-BL-SM :
Swivel Monopole Antenna - Cellular - Black - SMA

2J0B15-868-C884G :
Stub Antenna - 868 MHz - Black - RP-SMA
2J0B15-915-C884G :
Stub Antenna - 915 MHz - Black - RP-SMA

2JW1002-RPSMAM :
Swivel Antenna - WiFi/BT/ZigBEE/ISM 2.4/5.0 GHz - Black - RP-SMA

2JW1102-RPSMAM :
Blade Antenna - WiFi/BT/ZigBEE/ISM 2.4/5.0 GHz - Black - RP-SMA

2JW1001_GETUSA :
Swivel Antenna - GPS/GLONASS / BeiDou / Galileo   1561-1606 MHz - Black - SMA

— External - Screw Mount —

2J7741BGFA-BL-SM-3MLL100 :
Salt Shaker Antenna - 2 Cellular + 1 GNSS Black - 3 Meter Cable - SMA

2J7724B-BL-SM-1MLL100 :
Cellular Salt Shaker Antenna Black - 1 Meter Cable - SMA

2J6A24B-BL-SM-1MLL100 :
Cellular Mini Dome Antenna Black - 1 Meter Cable - SMA

2J6A24B-BL-SM-1MLL100 :
Cellular Mini Dome Antenna Black - 1 Meter Cable - SMA

— External - Adhesive/Magnetic Mount —

2J7741MPGFA-BL-SM3M-LL100 :
Salt Shaker Antenna - 2 Cellular + 1 GNSS Black - 3 Meter Cable - SMA

2J6041MPGFA-BL-SM3M-LL100 :
Puck Antenna - 2 Cellular + 1 GNSS Black - 3 Meter Cable - SMA

Antenna Cables:

Cables w/ SMA Bulkhead Connector

C485G-011.5MC137-UFL: 1.37mm diameter Coaxial cable - Total length 11.5 cm*
C485G-016.5MC137-UFL: 1.37mm diameter Coaxial cable - Total length 16.5 cm*
C485G-021.5MC137-UFL: 1.37mm diameter Coaxial cable - Total length 21.5 cm*
C485G-011.5MC081-MHF4: 0.81mm diameter Coaxial cable - Total length 11.5 cm*
C485G-016.5MC081-MHF4: 0.81mm diameter Coaxial cable - Total length 16.5 cm*
C485G-021.5MC081-MHF4: 0.81mm diameter Coaxial cable - Total length 21.5 cm*

Cables w/ RP-SMA Bulkhead Connector

C495G-011.5MC137-UFL: 1.37mm diameter Coaxial cable - Total length 11.5 cm*
C495G-016.5MC137-UFL: 1.37mm diameter Coaxial cable - Total length 16.5 cm*
C495G-021.5MC137-UFL: 1.37mm diameter Coaxial cable - Total length 21.5 cm*
C495G-011.5MC081-MHF4: 0.81mm diameter Coaxial cable - Total length 11.5 cm*
C495G-016.5MC081-MHF4: 0.81mm diameter Coaxial cable - Total length 16.5 cm*
C495G-021.5MC081-MHF4: 0.81mm diameter Coaxial cable - Total length 21.5 cm*

Antenna Mounts:

GMB-60-240-XX-N
PCTEL NMO Mini Magnetic Mount Base - Includes 20' of RG58/U oaxial Cable - No Connector

NMO58U-NC
PCTEL NMO Permanent Mount (Mounts from .030" - .065") - Includes 17' of RG58/U Coaxial Cable - No Connector

K-794
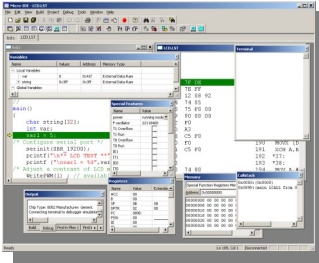PCTEL NMO Permanent Thick Mount (Up To 1/2") - Includes 17' of RG58/U Coaxial Cable - No Connector

TGBWP45C-NC
PCTEL NMO Bracket Mount - Includes 17' of RG58/U Coaxial Cable - No Connector

Complete Development Systems

Micro C 8051 Development System:
The ultimate 8051/52 Development system at a very affordable price. This fully integrated system includes:

- Micro-IDE - a Windows-based Integrated Development Environment
- Micro C - Optimizing 8051/52 C Compiler, assembler, linker
- Built-in serial loaders and terminal
- Complete online documentation, C Tutorial, Technical Manual
- Project examples
- 8051 Simulator and Debugger

BASCOM51
BASIC Compiler for the 8051 family of microcontrollers also available.

BASCOM-AVR:
Powerful, easy-to-use BASIC Compiler for the ATMEL® AVR® microcontrollers. Fully integrated into Micro-IDE.

- Structured BASIC with labels, Key words and Types
- Fast machine code instead of interpreted code
- Compiled programs work with all AVR™ microprocessors that have internal memory
- Special commands for LCD-displays , I2C chips and 1WIRE chips, PC keyboard, matrix keyboard, RC5 reception, software UART, SPI master and slave, IR remote code, graphical LCD's
- Local variables, user functions, library support
- Object file is ATMEL compatible. Use free AVR Studio from ATMEL to simulate code
- Integrated terminal emulator
- Integrated ISP programmer (application note AVR910.ASM)
- Built-in Downloader for MINI-MAX/AVR-C
- DEMO version compiles 2KB of code. Well suited for the ATTINY2313
- Support for TCP/IP

AVR Development System with Arduino Support

Includes WinAVR and Arduino language compilers

Downloader for MINI-MAX/AVR-C

Allows running C and Arduino programs on MINI-MAX/AVR-C

Many C and Arduino examples

Online help for language, libraries and examples

TM

Best in Programming Of Microcontrollers

Other Microcontroller Development Systems:
Other development systems are also available at very affordable prices (some are free). Each development system includes Micro-IDE, Micro C Compiler, Assembler, Linker, Serial downloader, Terminal, complete online documentation including C Tutorial, Technical Manual and project examples. All Micro C Development Systems have a **Site License** option for up to 25 installations. (***All Development Tools - except Micro C - support 64-bit Windows® Vista, 7 and 8**)

Development Systems		Simulators
Micro C 68HC08 Development System	ARM Development System	8051 Simulator
Micro C 6809 Development System	MSP Development System	68HC08 Simulator
Micro C 68HC11 Development System	SDCC Development System	68HC11 Simulator
Micro C 68HC12 Development System	STM Development System	68HC12 Simulator
Micro C 68HC16 Development System	AVR Development System	
Micro C 8096 Development System		

Flowcode™ is a powerful language that uses flowcharts and macros for developing microcontroller applications. The use of macros allows students and engineers to control highly complex electronic devices without getting bogged down in understanding the programming involved. Flowcode™ is used in education as a means of introducing students to the concepts of programming. Flowcode™ is used in industry for rapid development and as a means of managing large projects.

- Flowchart objects: Input, Output, Decision, Delay, Loop,   Connection, Formula, String, Interrupt, C Code, Macro
- Predefined components for RS232, I2C, SPI, ZigBee®, Can, IrDA, LIN, Bluetooth, TCP/IP and Web Server
- Predefined components for LCD, LED, 7-Segment, Keypad, Switch, ADC, EEPROM, PWM, Motor, and many others
- Underlying C code for advanced capabilities, C Code Customization, Floating Point support.
- Supported by BiPOM's MINI-MAX/AVR, MINI-MAX/P18, MINI-MAX/ARM-S, Pololu 3pi robot and many other microcontroller systems.
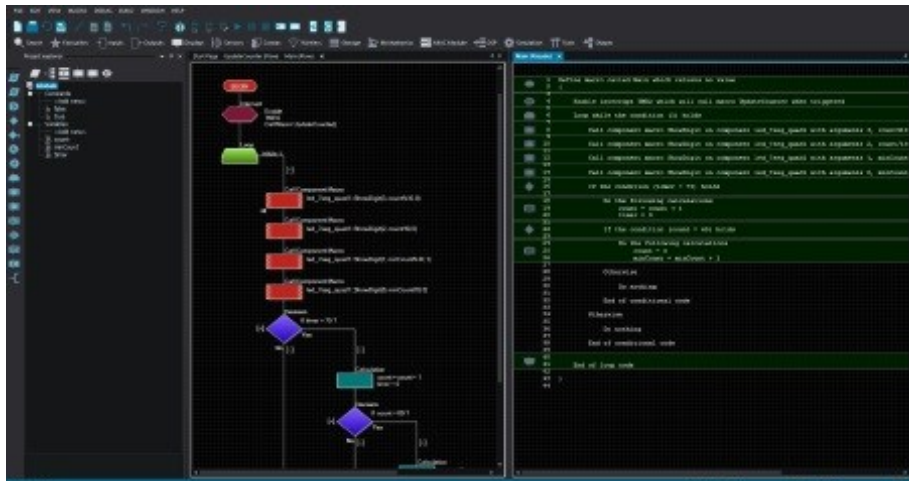
Flowcode V8

- **Chip Packs:** 8Bit PIC, 16Bit PIC, 32Bit PIC, AVR, Arduino, ARM, asp-berry Pi

- **Feature Packs:** Comms A, Comms B, Comms C, Basic IO, Displays, Mechatronics, DSP, Storage, Test & Debug, C-Code Sim, Sensors, Models

- **Upgrade from Flowcode V6**
- **Upgrade from Flowcode V7**

MINI-MAX/51 Microcontroller Board

	MINI-MAX/51-C2	MINI-MAX/51-D	MINI-MAX/51-E	MINI-MAX/51-F
MCU	AT89C51ED2	AT89C51ED2	AT89C51ED2	TI MSC1211Y4
program memory	64K Flash	64K Flash	64K Flash	16K Flash
RAM	2K	2K	2K	1280 bytes
EEPROM	2K EEPROM	2K EEPROM	2K EEPROM	512 bytes
ADC	5-channel, 10-bit ADC	N/A	N/A	8-Channel 24-bit ADC
DAC/PWM	N/A	N/A	N/A	4-Channel 16-Bit DAC, 16-bit PWM
Ethernet	N/A	N/A	10MBit Ethernet controller	N/A
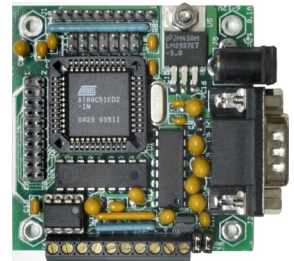
MINI-MAX/51 Set:
- MINI-MAX/51-C2 Microcontroller Board
- 2-row alphanumeric Liquid Crystal Display (LCD), Matrix Keypad
- BASCOM51 BASIC Compiler Demo version (size restricted)
- Micro-IDE Integrated Development Environment
- Serial cable, Power Supply, Online User's Guide, Example Projects
- TB-1 Training Board with 4-ch, 8-bit Analog/Digital Converter, buzzer, traffic lights, counter and interrupt inputs

MINI-MAX/AVR Microcontroller Board

	MINI-MAX/AVR-AU	MINI-MAX/AVR-BU	MINI-MAX/AVR-C	microClock
MCU	AT90USB162-16MU	AT90USB647	ATMEGA2560-16	ATMEGA32
program memory	8K Flash	64K Flash	256K Flash,	8K Flash
RAM	512 Bytes	4K	8K	512 bytes
EEPROM	512 Bytes	2K EEPROM	4K EEPROM	N/A
ADC	N/A	8-channel, 10-bit ADC	16-channel, 10-bit ADC	N/A
DAC/PWM	N/A	4 channel 8-bit, 6 channel 2~16-bit	N/A	N/A
USB Feature	Full Speed Device	USB 2.0 Device & OTG	N/A	N/A
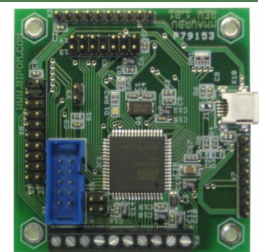
MINI-MAX/ARM Microcontroller Board

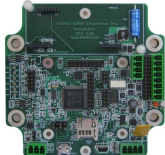|	MINI-MAX/ARM-C	MINI-MAX/ARM-E	MINI-MAX/ARM9260-E	GadgetPC
MCU	LPC2138(ARM7)	LPC2138(ARM7)	AT91SAM9260 (ARM9)	AT91SAM9260 (ARM9)
program memory	512K Flash	512K Flash	N/A	N/A
RAM	32K RAM	32K RAM	64M SDRAM	32MB DDR RAM
Flash ROM	1M serial Flash	1M serial Flash	8M Data Flash	8M Data Flash
ADC	5-Channel 10-Bit	5-Channel 10-Bit	4 analog inputs	N/A
RTC	√	√	√	N/A
Ethernet	N/A	ENC28J60	10/100 M	N/A
USB Port	N/A	N/A	2 host, 1device	4 2.0 host, 1 mini Device
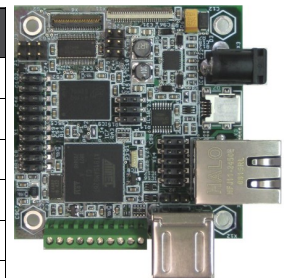
GadgetPC Development Kit: GadgetPC + DUB-E100 USB Ethernet Adapter + Accessories
GadgetPC Wi-Fi Kit: GadgetPC + WUA-1340 Wireless G USB Adapter + Accessories

Other Microcontroller Boards

MINI-MAX/STM32F1-C	nanoWiPOM	MINI-MAX/MSP430-C	MINI-MAX/P18
Basd on **STM32F103VGT6**, 8MHz crystal, up to 72 MHz internal operation	Basd on **STM32F103VGT6**, SocketModem® holder for GPRS, CDMA or 3G	**MSP430F5437IPNR** Ultra-Low Power Micro-controller based. 256K Flash, 16K RAM,USB port based on FTDI chipset	Based on **PIC18F458** Flash Microcontroller. 2 16-bit compare / capture PWM modules 10-bit 8-channel ADC, two analog comparators

MicroTRAK - Universal Training Kit for Microcontrollers

The ultimate training kit and project development platform with microcontrollers. Whether developing a new project with or learning about microcontrollers, you will find MicroTRAK a highly versatile carrier board with support for microcontroller systems with 8051, AVR®, ARM, Cortex™, MSP430™, 6811, 6808, PIC®, BASIC Stamp®, and other microcontrollers.

MicroTRAK Carrier Board

MicroTRAK Supports all BiPOM Electronics peripheral boards and includes practical examples for C, BASIC and Assembly Language Programming, Keypad and LCD interfacing, I2C bus, Serial port programming, Motor control, Analog to Digital Conversion and many other fun and instructive projects.

MicroTRAK serves not only as a training kit but also as a rapid project development tool. Pick a microcontroller board for the microcontroller family that you are familiar with, download software development tools from our website, plug the peripheral boards and/or display/keypad for your project to the **MicroTRAK** carrier board and you are much closer to a tangible proof-of-concept for your project. Retain your initial investment in your training kit when moving to a different microcontroller family. Simply change the microcontroller board and the optional I/O Module. All cables, carrier board, power supply, peripheral boards, keypad, LCD display, etc. remain the same.

MicroTRAK supports for a wide range of microcontroller and peripheral boards, has sockets for dual peripheral boards, keypad interface, industry-standard display interface for alphanumeric LCD and VFD displays, connectors and cables for connection to a standard breadboard, expansion port for a microcontroller-specific pluggable module (for example, 8051 I/O Module) with port connectors, port indicator LED's and port control DIP Switches.

MicroTRAK/AVR-C Complete: MicroTRAK/AVR-C Complete includes MicroTRAK Carrier Board, MINI-MAX/AVR-C Microcontroller Board, TB-1 Training Board, PROTO-1 Prototyping Board, Universal I/O Module, LCD242-BK LCD, KP1-4X4 Keypad, Cables, Adapter, Training Manuals, Labbook, Demo version of BASCOM-AVR BASIC Compiler, AVR Studio, WinAVR C Compiler, Assembler, Micro-IDE, example projects, Serial downloader.

MicroTRAK/51-C2 Complete: MicroTRAK/51-C2 Complete includes MicroTRAK Carrier Board, MINI-MAX/51-C2 Microcontroller Board, TB-1 Training Board, PROTO-1 Prototyping Board, Universal I/O Module, LCD242-BK LCD, KP1-4X4 Keypad, Cables, Adapter, Training Manuals, Lab book, Demo versions of BASCOM51 BASIC Compiler, Micro C Compiler, Assembler, Micro-IDE, example projects, full version of SDCC C Compiler (open-source), Serial downloader.

MicroTRAK/51-E Complete: MicroTRAK/51-E Complete includes MicroTRAK Carrier Board, MINI-MAX/51-E Microcontroller Board with Ethernet, TB-1 Training Board, MMC-RTC-1 board with Real-Time Clock and MultiMediaCard (MMC), Universal I/O Module, LCD242-BK LCD, KP1-4X4 Keypad, Cables, Adapter, WEB51 Web Server firmware, Training Manuals, Lab book, Demo versions of BASCOM51 BASIC Compiler, Micro C Compiler, Assembler, Micro-IDE, example projects, full version of SDCC C Compiler (open-source), Serial downloader.

MicroTRAK/51-F Complete: MicroTRAK/51-F Complete includes MicroTRAK Carrier Board, MINI-MAX/51-F Microcontroller Board, TB-1 Training Board, PROTO-1 Prototyping Board, Universal I/O Module, LCD242-BK LCD, KP1-4X4 Keypad, Cables, Adapter, Training Manuals, Labbook, Demo version of BASCOM51 BASIC Compiler, Demo Version of Micro C Compiler, Assembler, Micro-IDE, example projects, full version of SDCC C Compiler (open-source), Serial downloader.

MicroTRAK/P18 Complete: MicroTRAK/P18 Complete includes MicroTRAK Carrier Board, MINI-MAX/P18 Microcontroller Board, TB-1 Training Board, PROTO-1 Prototyping Board, Universal I/O Module, LCD242-BK LCD, KP1-4X4 Keypad, Cables, Adapter, Training Manuals, Labbook, MC Development System, example projects, Serial downloader.

MicroTRAK/ARM-C Complete: MicroTRAK/ARM-C Complete includes MicroTRAK Carrier Board, MINI-MAX/ARM-C Microcontroller Board, TB-1 Training Board, PROTO-1 Prototyping Board, Universal I/O Module, LCD242-BK LCD, KP1-4X4 Keypad, Cables, Adapter, Manuals, ARM Development System (GCC Compiler, assembler, linker, downloader, examples, Serial downloader).

MicroTRAK/ARM-E Complete: MicroTRAK/ARM-E Complete includes MicroTRAK Carrier Board, MINI-MAX/ARM-E Microcontroller Board with Ethernet, TB-1 Training Board, MMC-RTC-1 board with Real-Time Clock and 128MB MultiMediaCard (MMC), Universal I/O Module, LCD242-BK LCD, KP1-4X4 Keypad, Cables, Adapter, WebCatPlus Web Server firmware, Manuals, ARM Development System (GCC Compiler, assembler, linker, downloader, examples, Serial downloader).

MicroTRAK/STM32-F1 Complete: MicroTRAK/STM32-F1 Complete includes MicroTRAK Carrier Board, MINI-MAX/STM32F1-C Microcontroller Board, TB-1 Training Board, Universal /O Module, MMC-RTC-1 board with Real-Time Clock and 128MB MultiMediaCard (MMC), LCD242-BK LCD Display, KP1-4X4 Matrix Keypad, Serial cable, 6VDC Adapter, Micro-IDE, STM Development System (Yagarto Compiler, Assembler, Linker), Serial downloader, example projects.

MicroTRAK/MSP430-C Complete: MicroTRAK/MSP430-C Complete includes MicroTRAK Carrier Board, MINI-MAX/MSP430-C Microcontroller Board, TB-1 Training Board, PROTO-1 Prototyping Board, Universal I/O Module, LCD242-BK LCD, KP1-4X4 Keypad, Cables, Adapter, Training Manuals, Labbook, Micro-IDE, example projects, MSPGCC GNU C Compiler, Serial downloader.

Lower cost Starter versions of MicroTRAK kits are available without any peripheral boards.

MicroTRAK Input/Output Modules

Universal I/O Module

Universal I/O Module allows access to all input/output (I/O) ports of the microcontroller on the MicroTRAK development platform.
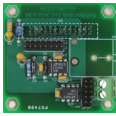
Universal I/O Module has 32 switches to control the microcontroller inputs and 32 LED's to indicate port status.
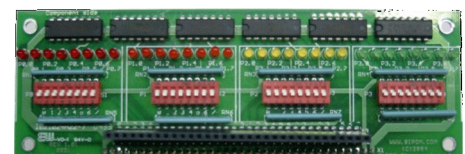
Peripheral Boards

THERMOCOUPLE-1
One channel thermocouple board with cold junction compensation support.

THERMOCOUPLE-4
Four channel thermocouple board with cold junction compensation support.

ATB-5PHI
Connects Phidgets sensors to MINI-MAX Boards.

ATB-5CL
Interfaces 4-20mA loop devices to MINI-MAX Boards.

TB-1
Training Board, programmable Traffic lights, 4-channel 8-bit analog inputs, buzzer, switches, & counter/timers.

TH-1-SHT
Digital temperature/humidity sensor peripheral board for MINI-MAX and other microcontroller systems.

T-1-1820
Digital temperature sensor peripheral board for MINIMAX and other microcontroller systems.

MMC-RTC-1
For storage/data logger applications, socket for Multi Media Card, battery backed clock/calendar.

CB-1
CB-1, Wireless board. Connect to wireless devices. [IRDA, ZigBee®, Bluetooth].
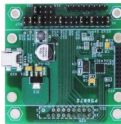
DM-1
High power, long range 900MHz wireless board using DigiMesh™ XTEND.

BRD-RS232-TTL-1
RS232 to TTL Converter. Also supports XBee® ZigBee® modules.
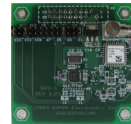
GPS-1
Global Positioning System (GPS) Peripheral Board.
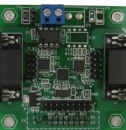
UART-2RS232
Adds two RS232 channels or two [optional] RS485 channels.

OLED-1
128 x 64 Grayscale OLED Graphics Display with SPI interface.
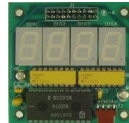
LED-1
7 - segment LED display Four digits.

LCD-1
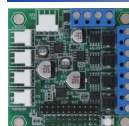LCD Adapter Board for interfacing to graphical LCD's using serial (SPI) interface.
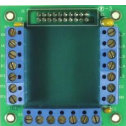
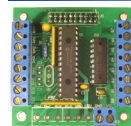### TERMINAL-1
For expansion of I/O Ports to terminal blocks.

MOTOR-2
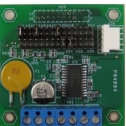Controls two stepping motors up to 2.5 A

HCD-4
4-channel high current driver peripheral board. Also 4 servo motor outputs.

DIO-1
I/O expander board with 8 outputs & 12 TTL/CMOS inputs/outputs, 400mA. Adds digital I/O.
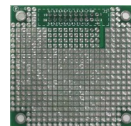
MOTOR-1B
Universal Stepper motor controller board.

RELAY-4
Four [4] power relays. For control of high current devices.

RELAY-4REED
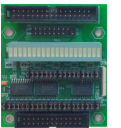Four [4] reed relays. For control of low current devices.

PROTO-1
Prototyping board with connector [stackable]. Adds custom circuits to microcontroller.

RELAY-2
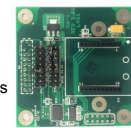Two [2] power relays. For control of high current devices.

DLPB-1
I/O Expander board adds extra I/O and high current outputs to MINI-MAX/ARM9260-E

POD-1
Allows connecting Apple® products such as iPod®, iPhone®, iPad® to MINI-MAX microcontroller boards as well as other microcontroller systems

SW-1
Wireless peripheral board to connect SkyWire NL-SW-LTE-S7588 modem to MINI-MAX microcontroller boards.
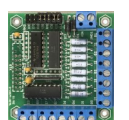
Standoff Kits
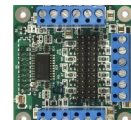Allows stacking of multiple peripheral boards.

RTC-1
Real Time Clock/calendar board with battery backup Ideal for Internet of Things (IoT) applications.

OPTO-8-DC
8-channel opto-isolated dry contact input board.

DAQ-2543-LOOP-8
8-channel, 0 to 4V, 0-20mA or 4-20mA jumper configurable analog inputs with 12-bit resolution. Ideal for Internet of Things (IoT) applications.
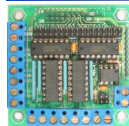
DAQ-2543-DA1
DAQ-2543-DA-1, with 11 channel 12-bit A/D converter and 1 channel, 10-bit D/A converter, monitors sensors and control devices.
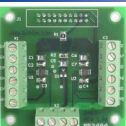
DAQ-127 and DAQ-128
8 channel, 12 bit, analog input & 1 channel,10 bit analog output, monitors sensors and controls devices.

OPTO-9
Opto-isolated inputs. One fast and 8 regular channels.

DAC-8
Digital to analog converter board with 8 analog outputs channels, controls devices, and generates waveforms.

Duino-Adapter-MMP
Duino-Adapter-MMP is an adapter board that allows MINI-MAX peripherals to be installed on top of Arduino compatible microcontroller boards.

Tower of BiPOM !
Power of BiPOM !
Stacking peripheral concept
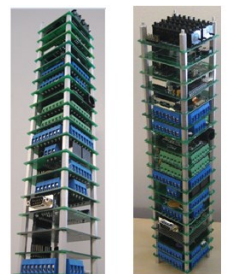
Breadboard Prototype Adapters

D-Sub Breadboard Adapters

These handy adapters make DB9, DB15, DB15HD, DB25 connections in prototyping projects much easier.

Product	Description
PBC9F/PBC9M	DB9 Female/Male Breadboard Adapter
PBC15F/PBC15M	DB15 Female/Male Breadboard Adapter
PBC15HDF/PBC15HDM	DB15HD Female/Male Breadboard Adapter
PBC25F/PBC25M	DB25 Female/Male Breadboard Adapter

0.1" Header Breadboard Adapters
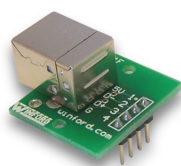
- Quickly bring connections to breadboards
- Great for microcontroller circuits
- Each pin labeled according to header pin numbering

PBC2X5   PBC2X7

USB Breadboard Adapters

- Quickly bring USB connections to breadboards
- Great for prototyping USB microcontroller circuits
- Each pin labeled according to USB pin numbering
- Overall dimensions: 1.06" x 1.0"

PBCUB1F

Modular Jack Breadboard Adapters

- Quickly bring connections to breadboards
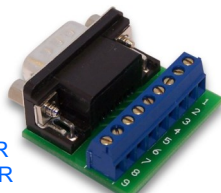- Great for serial circuits
- Each pin number clearly labeled

PBC6P6C   PBC8P8C

Breakout Boards (Terminal Boards)

D-Sub Breakout Boards
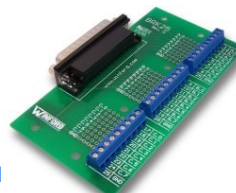
BRKTD9F-R
BRKTD9M-R   BRK15F
                   BRK15M   BRK25F
                                   BRK25M   BRK37F
                                                   BRK37M
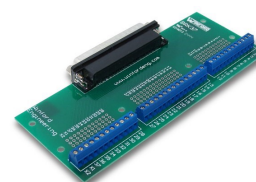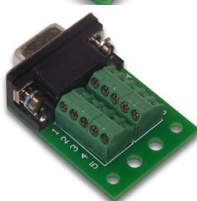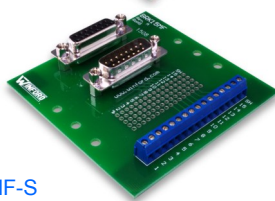
BRKSD9M
BRKSD9F   BRK15MF-S   BRK25MF-S   BRKDDMC40F-R
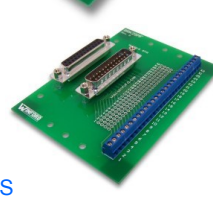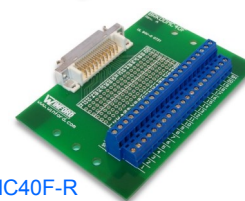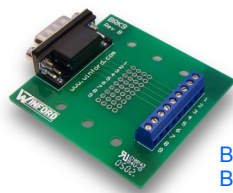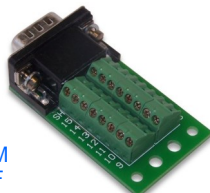
BRK9F-R
BRK9M-R   BRKSD15HDM
                 BRKSD15HDF   BRKSD26HDM   BRKSD44HDM
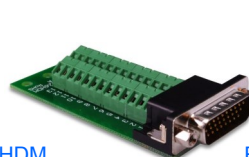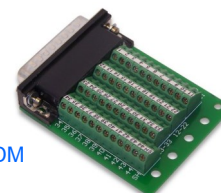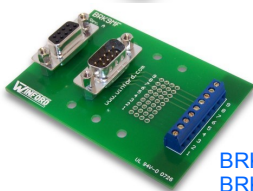
BRK9MF-S   BRK15HDF-R
                  BRK15HDM-R   BRKDD26HDF-R
                                      BRKDD26HDM-R   BRKDD44HDF
                                                           BRKDD44HDM
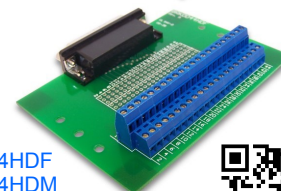
Breakout Boards (Terminal Boards)

D-Sub Breakout Boards
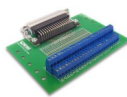
BRKDD50F
BRKDD50M

BRKDD62HDF

BRK78HDF

BRKADP100FV1

DTA3508
DTA3514
DTA3516
DTA3520
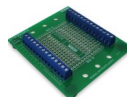
DTB3528
DTB3532
DTB3540

RJ-21 Breakout Boards
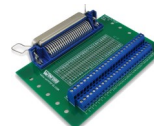
BRKDC50F-R-FT
BRKDC50F-R-DIN

0.1" Header Breakout Boards
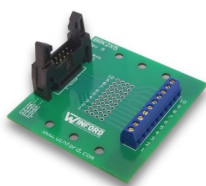
BRK2X5-L-FT

BRK2X7

BRK2X8
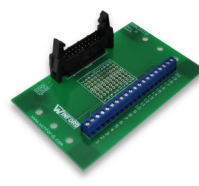
BRK2X10
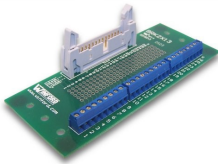
BRK2X13
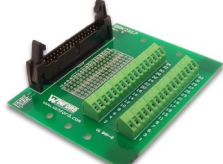
BRK2X17
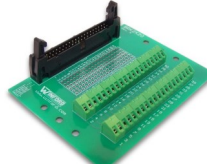
BRK2X20
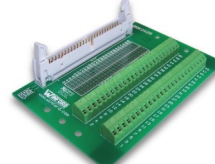
BRK2X25

ETH32 Breakout Board

BRKW01

0.156" Header

BRKCH308-FR

USB Breakout Boards
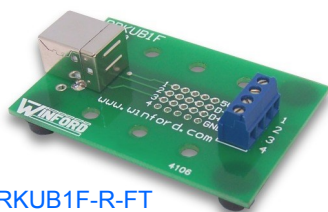
BRKUB1F-R-FT

BRKUA1F-R-FT

Terminal Boards

TTA3510
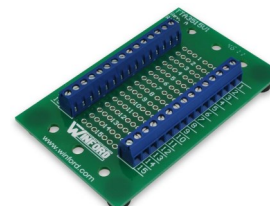
TTA3515V1

Modular Jack Breakout Boards
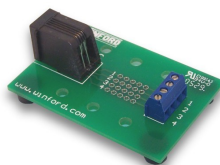
BRK4P4C
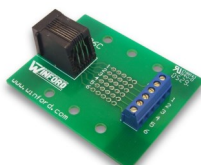
BRK6P6C
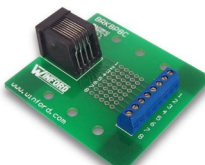
BRK8P8C
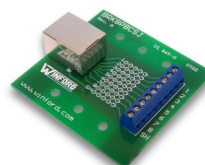
BRK8P8CSJ
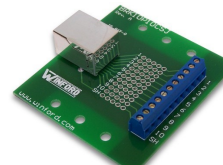
BRK10P10CSJ
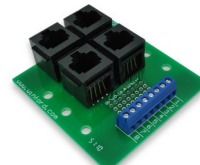
BRK8P8C4B-S

Relay Boards
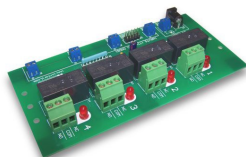
RLY104
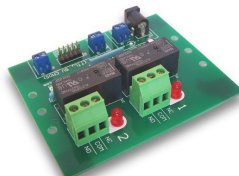
RLY102
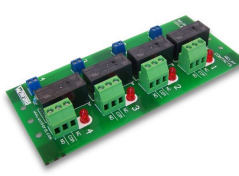
RLP104

DB25 Bus Board
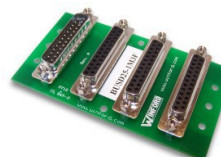
BUSD25-1M3F
BUSD25-1F3M

Full Color TFT Displays

Part Number	Resolution	Interface RS232	TTL	I2C	RS422	USB	Touch Res.	PCAP	Keypad	Module Size W x H x T (mm)	Display Size W x H (mm)
(e)GTT29A	320 x 102	●	●	●		●			●	140.00 x 38.00 x 21.95	70.08 x 22.34
(e)GTT35A	320 x 240	●	●	●	●	●	●	●		90.00 x 78.00 x 19.53	70.08 x 52.56
(e)GTT38A	480 x 116	●	●	●		●	●			140.00 x 38.00 x 19.55	95.04 x 22.97
(e)GTT43A	480 x 272	●	●	●	●	●	●	●		135.10 x 80.50 x 17.10	95.04 x 53.86
(e)GTT50A	800 x 480	●	●	●	●	●	●	●		142.00 x 90.00 x 17.00	108.00 x 64.80
GTT52B*	480 x 128	●	●	●	●	●			●	180.00 x 65.00 x 20.00	127.15 x 33.91
(e)GTT70A	800 x 480	●	●	●	●	●	●	●		185.00 x 102.00 x 18.80	153.84 x 85.63

GTT50A GTT43A GTT70A GTT29A GTT38A GTT35A

Product not yet released. Custom sizes and designs are available upon request.

Character LCD

Intelligent Series

LK204-7T-1U-WB

LK404-25

LK204-25-WB

LK162A-4T

| Part Number	Characters x Lines	Interface RS232	TTL	I2C	RS422	USB	Keypad (Max keys)	GPOs	Display Size W x H (mm)	Color Options	Options
LCD0821	8 x 2	●	●	●			N/A	1	27.80 x 11.50	XX,WB,GW,IY,R	-E,-V
LCD2041	20 x 4	●	●	●			N/A	1	70.40 x 20.80	XX,WB,GW,IY,R	-E,-V,-VPT
LK162-12	16 x 2	●	●	●		●	12	7	56.20 x 11.50	XX,WB,GW,IY,R	-E,-V
LK162A-4T*	16 x 2	●	●	●		●	4	2	48.20 x 8.90	XX,WB,FGW,TCI	-E
LK162B-7T*	16 x 2	●	●	●		●	7	2	56.20 x 11.50	XX,WB,FGW	-E,-V
LK202-25	20 x 2	●	●	●		●	25	6	73.50 x 11.50	XX,WB,GW,IY,R	-E,-V
LK204-25	20 x 4	●	●	●	●	●	25	6	70.40 x 20.80	XX,WB,GW,IY,R	-E,-V,-VPT
LK204-7T-1U*	20 x 4	●	●	●		●	7	3	77.30 x 23.60	WB,GW,TCI,YG	-E,-LV
LK402-25	40 x 2	●	●	●	●	●	25	6	147.50 x 11.50	XX	-E,-VPT
LK404-25	40 x 4	●	●	●			25	6	140.45 x 23.16	XX	-E,-VPT

*Has 3 red/green bi-color LEDs ** Standard temperature range is 0° to +50°C, voltage is +5Vdc ±0.25V

Option	-E	-LV	-V	-VPT
Description	Extended Temperature -20° to +70°C	Low Voltage 3.3Vdc	Wide Voltage 9-15Vdc	Efficient Wide Voltage 9-35Vd

Color Ext.	Text	Background
XX*	Black	Yellow/Green
WB	White	Blue
GW	Grey	Grey/White
IY	Yellow	Black
R	Red	Black
FGW**	Dark Grey	Grey/White
TCI	Tri-Color	Black
FA	Amber	Black
FB	Blue	Black
FG	Green	Black

* No Extension, ** FFSTN

Economy Series

MOS-AL204B-YX
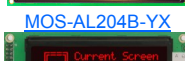
MOU-AL202C-XR

MOI-AL162A-WB

Part Number	Characters x Lines	Interface RS232	TTL	I2C	USB	GPOs	Module Size W x H x T (mm)	Display Size W x H (mm)	Color Options YX	BW	WB	XY	XR	FA	FB	FG	FW
MOS-AL162A	16 x 2	●	●			3	80.00 x 36.00 x 25.60	56.20 x 11.50	●	●	●	●	●				
MOS-AL162F	16 x 2	●	●			3	69.00 x 21.50 x 23.00	47.56 x 11.00	●								
MOS-AL202C	20 x 2	●	●			3	116.00 x 37.00 x 26.10	73.50 x 11.50	●	●	●	●	●	●	●	●	●
MOS-AL204B	20 x 4	●	●			3	146.00 x 62.50 x 26.60	118.84 x 38.47	●								
MOS-AL242A	24 x 2	●	●			3	118.00 x 36.00 x 27.50	88.30 x 11.50	●								
MOI-AL162A	16 x 2			●		3	80.00 x 36.00 x 25.60	56.2 x 11.50	●	●	●	●	●				
MOI-AL202C	20 x 2			●		3	116.00 x 37.00 x 26.10	73.50 x 11.50	●	●	●	●	●	●	●	●	●
MOI-AL204B	20 x 4			●		3	146.00 x 62.50 x 26.60	118.84 x 38.47	●								
MOI-AL242A	24 x 2			●		3	118.00 x 36.00 x 27.50	88.30 x 11.50	●								
MOU-AL162A	16 x 2				●	3	80.00 x 36.00 x 25.60	56.20 x 11.50	●	●	●	●	●				
MOU-AL202C	20 x 2				●	3	116.00 x 37.00 x 26.10	73.50 x 11.50	●	●	●	●	●	●	●	●	●
MOU-AL204B	20 x 4				●	3	146.00 x 62.50 x 26.60	118.84 x 38.47	●								
MOU-AL242A	24 x 2				●	3	118.00 x 36.00 x 27.50	88.30 x 11.50	●								

Color Ext.	Text	Background
YX	Black	Yellow/Green
BW	White	Blue
WB	Light Blue	Grey/White
XY	Yellow	Black
XR	Red	Black
FA	Amber	Black
FB	Blue	Black
FG	Green	Black
FW	White	Black

Parallel Series

MOP-AL162A-BBTW

MOP-AL204B-BYFY

Part Number	Characters x Lines	Module Size W x H x T (mm)	Display Size W x H (mm)	Color Options BYFY	BBTW	BGFW	BTTY	BBTR	BFTA	BFTB	BFTG	BFTW	BYRN
MOP-AL082B	8 x 2	58.00 x 32.00 x 14.00	27.81 x 11.50	●	●	●	●	●					
MOP-AL162A	16 x 2	80.00 x 36.00 x 14.00	56.20 x 11.50	●	●	●	●	●				●	
MOP-AL202C	20 x 2	116.00 x 37.00 x 14.50	73.50 x 11.50	●	●	●		●	●	●	●		
MOP-AL204A	20 x 4	98.00 x 60.00 x 15.00	70.40 x 20.80	●	●	●	●	●					
MOP-AL204B	20 x 4	146.00 x 62.50 x 13.00	118.84 x 38.47	●									
MOP-AL242A	24 x 2	118.00 x 36.00 x 14.00	88.30 x 11.50	●									
MOP-AL402A	40 x 2	182.00 x 33.50 x 13.00	147.50 x 11.50	●									
MOP-AL404C	40 x 4	190.00 x 54.00 x 14.00	140.45 x 23.16	●									

Color Ext.	Text	Background
BYFY	Black	Yellow/Green
BBTW	White	Blue
BGFW	Light Blue	Grey/White
BTTY	Yellow/Green	Black
BBTR	Red	Black
BFTA	Amber	Black
BFTB	Blue	Black
BFTG	Green	Black
BFTW	White	Black
BYRN	Black	Yellow/Green No Backlight

Graphic OLED

Part Number	Cols x Rows	Interface	Keys	GPOs	Module Size	Pixel Size	Display Size	Options
GOK12832A-25-SM-OY	128 x 32	RS232,TTL,I2C	25	2	86.10 x 35.10 x 17.70	0.41 x 0.39	62.00 x 24.00	-E,-VS,-LV

GOK12832A-25-SM-OY

Available Options: *-LV: Low Voltage 3.3Vdc, -VS: Super Wide Voltage 5-15Vdc, -E: Extended Temperature -40° to +80°C*
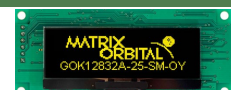
Graphic LCD

Intelligent Series

GLK19264A-7T-1U-FGW
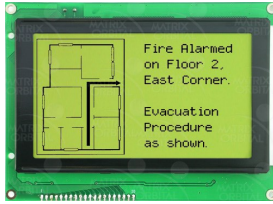
GLK240128-25

Part Number	Resolution	RS232	TTL	I2C	RS422	USB	Keypad (Max keys)	GPOs	Module Size W x H x T (mm)	Display Size W x H (mm)	XX	WB	FGW	YG	TCI	GW	-E	-LV	-V	-VPT	-VS
GLK12232A-25-SM	122 x 32	•	•	•		•	25	2	86.10 x 35.10 x 20.67	53.64 x 15.64		•			•	•	•				•
GLK12232-25	122 x 32	•	•	•		•	25	2	98.00 x 60.00 x 20.10	69.50 x 20.50		•	•					•			
GLK19264A-7T-1U	192 x 64	•	•	•	•	•	7	6	142.00 x 38.00 x 34.40	74.85 x 24.93		•	•	•	•		•	•		•	
GLK240128-25	240 x 128	•	•	•	•	•	25	6	144.00 x 104.00 x 29.70	107.95 x 57.55	•	•	•			•		•	•		
GLK24064-25	240 x 64	•	•	•	•	•	25	6	180.00 x 65.00 x 30.90	127.16 x 33.88	•	•	•			•		•			
GLK24064R-25-1U	240 x 64	•	•	•	•	•	25	6	138.00 x 38.00 x 28.21	93.57 x 24.93	•	•			•	•		•			

Color Ext.	XX*(No Extension)	WB	FGW	YG	TCI	GW
Text	Black	White	Dark Grey	Black	Tri Color	Grey
Background	Yellow/Green	Blue	Grey/White	Yellow/Green	Black	Grey/White

Available Options:
-VS: Super Wide Voltage 5-15Vd
(Others as previous products)

Parallel Series

MOP-GL12864F-BBTW

Part Number	Resolution	Module Size W x H x T (mm)	Display Size W x H (mm)	BYFY	BBTW	BGFW	BWFW	BSSX
MOP-GL12232D	122 x 32	65.00 x 27.00 x 12.00	60.20 x 18.00			•	•	
MOP-GL12864F	128 x 64	75.00 x 52.70 x 9.00	60.00 x 32.00			•		
MOP-GL240128D	240 x 128	144.00 x 104.00 x 15.00	114.00 x 64.00	•	•		•	
MOP-GL24064A	240 x 64	180.00 x 65.00 x 16.00	132.20 x 39.20	•	•		•	
MOP-GL24064R	240 x 64	112.00 x 38.00 x 31.00	98.00 x 28.40			•	•	•

Color Extension	Text	Background
BYFY	Black	Yellow/Green
BBTW	White	Blue
BGFW	Grey	Grey/White
BWFW	Blue	Grey
BSSX	Tri-Color	Black

Graphic Touch LCD

Intelligent Series

GLT240128-FGW

Part Number	Columns x Rows	RS232	TTL	I2C	RS422	USB	GPOs	Module Size W x H x T (mm)	Display Size W x H (mm)	XX	WB	GW	TCI	FGW	-VPT	-VS	-LV
GLT12232A-SM	122 x 32	•	•	•		•	2	86.10 x 35.10 x 23.02	53.64 x 15.64		•	•	•			•	•
GLT24064	240 x 64	•	•	•	•	•	6	180.00 x 65.00 x 30.90	127.16 x 33.88	•	•				•	•	
GLT24064R-1U	240 x 64	•	•	•	•	•	6	138.00 x 38.00 x 26.91	93.57 x 24.93		•		•	•	•		
GLT240128	240 x 128	•	•	•	•	•	6	144.00 x 104.00 x 27.80	107.95 x 57.55	•	•				•		

Color Ext.	Text	Background
*XX	Black	Yellow/Green
WB	White	Blue
GW	Grey	Grey/White
TCI	Tri Color	Black
FGW	Dark Grey	Grey/White

Available Options: *-LV:* Low Voltage 3.3Vdc, *-VS:* Super Wide Voltage 5-15Vdc, *-VPT:* Efficient Wide Voltage - 9-35Vdc

Parallel Series

Part Number	Resolution	Module Size(mm)	Display Size (mm)	Color Options
MOP-GLT240128D	240 x 128	144.00 x 104.00 x 16.53	114.00 x 64.00	-BBTW, -BGFW, -BYFY

Character OLED

OK204-25-OW

Part Number	Characters x Lines	RS232	TTL	I2C	USB	RS422	Keypad (Max Keys)	GPOs	Module Size W x H x T (mm)	Display Size W x H (mm)	OB	OG	OR	OW	OY	-E	-V	-VPT
OLED0821	8 x 2	•	•	•			N/A	1	58.00 x 32.00 x 22.40	38.00 x 16.00				•		•	•	•
OK162-12	16 x 2	•	•	•	•		12	7	80.00 x 36.00 x 25.10	66.00 x 16.00				•	•	•	•	•
OK202-25	20 x 2	•	•	•	•		25	6	116.00 x 37.00 x 25.00	85.00 x 18.60				•	•	•	•	•
OK204-25	20 x 4	•	•	•		•	25	6	98.00 x 60.00 x 26.10	77.00 x 25.20				•	•	•	•	•

Color Ext.	Text	Background
OB	Blue	Black
OG	Green	Black
OR	Red	Black
OW	White	Black
OY	Yellow	Black

Available Options: *-E:* Extended Temperature -40° to +80°, *-LV:* Low Voltage 3.3Vdc, *-VS:* Super Wide Voltage 5-15Vdc, *-VPT:* Efficient Wide Voltage - 9-35Vdc

Character VFD

Intelligent Series
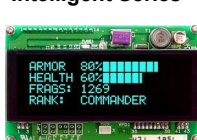
VFD2041

Part Number	Chars x Lines	RS232	TTL	I2C	RS422	USB	Keypad	GPOs	Module Size W x H x T (mm)	Display Size W x H (mm)	-E	-V	-VPT
VFD2041	20 x 4	•	•	•			N/A	3	98.00 x 60.00 x 24.40	70.80 x 20.90	•		•
VK162-12	16 x 2	•	•	•		•	12 Key	7	80.00 x 36.00 x 27.67	51.40 x 11.40	•	•	
VK202-25	20 x 2	•	•	•		•	25 Key	6	116.00 x 37.00 x 29.48	70.80 x 11.50	•	•	
VK204-25	20 x 4	•	•	•	•	•	25 Key	6	98.00 x 60.00 x 28.98	70.80 x 20.90	•		•

Available Options:
-E: Extended Temperature -40° to +85°C
-V: Low Voltage 3.3Vdc
-VPT: Efficient Wide Voltage - 9-35Vdc

Parallel Series

Part No.	Chars x Lines	Display Size(mm)
MOP-AV162A-BNNN	16 x 2	51.40 x 11.40
MOP-AV202C-BNNN	20 x 2	70.80 x 11.50
MOP-AV204A-BNNN	20 x 4	70.80 x 20.90

VFD Filters are available for the 20x2 and 20x4

MOP-AV162A-BNNN   *MOP-AV202C-BNNN*

Economy Series
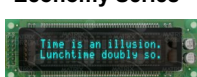
MOU-AV202C

Part No.	Ch x Ln	Interface	GPOs	Module Size(mm)	Display Size(mm)
MOS-AV162A-NT3SE	16 x 2	-RS232,-TTL	3	116.00 x 37.00 x 20.10	51.40 x 11.40
MOS-AV202C-NT3SE	20 x 2	-RS232,-TTL	3	116.00 x 37.00 x 22.00	70.80 x 11.50
MOI-AV162A-NT3IE	16 x 2	-I2C	3	116.00 x 37.00 x 20.10	51.40 x 11.40
MOI-AV202C-NT3IE	20 x 2	-I2C	3	116.00 x 37.00 x 22.00	70.80 x 11.50
MOU-AV162C-NT3SJ	16 x 2	USB	3	116.00 x 37.00 x 20.10	51.40 x 11.40
MOU-AV202C-NT3SJ	20 x 2	USB	3	116.00 x 37.00 x 22.00	70.80 x 11.50

BiPOM Electronics, Inc.   Displays

HTT Displays

The HTT Displays are plug and play Embedded HDMI HMI TFT display with a USB touch screen interface.

Models	Size	Resolution	Headers		Touch			Voltage			
			H5	H6	TPN	TPR	TPC	-V5	-VS	-V	-VPT
HTT101F	10.1"	1280 x 800	●	●	●				●		
HTT101G	10.1"	1280 x 800	●	●		●		●		●	
HTT50A	5.0"	800 x 480	●	●		●		●			●
HTT50G	5.0"	800 x 480	●	●		●		●			●
HTT70A	7.0"	800 x 480	●	●	●	●		●			●
HTT70G	7.0"	800 x 480	●	●		●		●			●
HTT104A	10.4"	1024 x 100	●	●	●	●		●			●

HTT70A

HTT70G

Headers Options:
-H5: Horizontal **-H6:** Vertical

Touch Options:
-TPN: NON-Touch **-TPR:** Resistive touch **-TPC:** Capacitive touch

Voltage Options:
-V5: 5Vdc **-VS:** 5-15Vdc **-V:** 9-15Vdc **-VPT:** 5-35Vdc

Back Light Options:
-BLH: High back light **-BLM:** medium back light

EVE2/EVE3 Series

The EVE/EVE2/EVE3 controller allows fast development of SPI TFT and QSPI TFT displays to almost any micro-controller to create HMI/GUI systems.

Models	Size	Resolution	Touch		
			TPN	TPR	TPC
EVE2-29A	2.9"	320 x 102	●		
EVE2-35A	3.5"	320 x 240	●	●	
EVE2-35G	3.5"	320 x 240			●
EVE2-38A	3.8"	480 x 116		●	
EVE2-38G	3.8"	480 x 116			●
EVE2-43A	4.3"	480 x 272	●	●	
EVE2-43G	4.3"	480 x 272			●

Models	Size	Resolution	Touch		
			TPN	TPR	TPC
EVE2-50A	5.0"	800 x 480	●	●	
EVE2-50G	5.0"	800 x 480			●
EVE2-70A	7.0"	800 x 480	●	●	
EVE2-70G	7.0"	800 x 480			●
EVE3-35A	3.5"	320 x 240	●	●	
EVE3-35G	3.5"	320 x 240			●
EVE3-38A	3.8"	480 x 116		●	

Models	Size	Resolution	Touch		
			TPN	TPR	TPC
EVE3-38G	3.8"	480 x 116			●
EVE3-43A	4.3"	480 x 272	●	●	
EVE3-43G	4.3"	480 x 272			●
EVE3-50A	5.0"	800 x 480	●	●	
EVE3-50G	5.0"	800 x 480			●
EVE3-70A	7.0"	800 x 480	●	●	
EVE3-70G	7.0"	800 x 480			●

EVE3-70A

EVE2-38A

EVE2-38G

NOR Flash Options (for EVE3 series): -F0: 0Mb SPI NOR Flash **-F32:** 32Mb Quad SPI NOR Flash **-F128:** 128Mb Quad SPI NOR Flash

VFD Filters

Product	Size	Description
GRY202A	2 x 20	**Circular Polarized and hard coated Gray**
GRY204	4 x 20	
BLU204	4 x 20	**Standard Blue Filter**
GRN202A	2 x 20	**Standard Green Filter**
GRN204	4 x 20	
RED202A	2 x 20	**Standard Red Filter**
RED204	4 x 20	

VFD Filters
A VFD will wash out in direct sunlight. The advantage of a filter is to provide better contrast and protection for the VFD. There are two main types: Circular and regular polarized. Circular   polarized come in gray and are hard coated providing the ultimate outdoor filter. The regular filters are a less expensive solution for indoor VFD's, but still can be used outdoors. This,   however, will not provide the same protection as the gray ones. All fil- ters are available in 2 x 20 and the 4 x 20 sizes.

Enclosed Display

Two types enclosures to meet your needs, a lightweight durable plastic (-PL) and a rugged metal (-MT). Control of these LCD dis- plays has been simplified to a set of commands delivered by **RS232 or USB**. **7 key tactile keypad and 3 tri-color indicator LED's.**

ELK204-7T-PL / ELK204-7T-MT:
20x4 enclosed character display .

Model	-GW	-TCI	-WB	-YG
Backlight Color	White	Black	Blue	Yellow/Green
Text Color	Gray	Tri-Color	White	Gray

EGLK19264A-7T-PL / EGLK19264A-7T-MT:
192x64 enclosed graphic LCD display .

Model	-FGW	-TCI	-WB	-YG
Backlight Color	Grey/White	Black	Blue	Yellow/Green
Text Color	Black	Tri-Color	White	Gray

GX Series

GX24064 LCD display with black aluminum bay insert
Pixels: 240 x 64
Active Area: 93.57 x 24.93 mm
Interface: USB
Supply Current: 311 mA

Model	-WB	-TCI	-FGW
Backlight Color	Blue	TriColor	White
Text Color	White	Black	Gray

Available options:
-BBI (3ft A to B Mini USB cable)
-MCE remote

PC Drive Bay Inserts

5-1/4" and 3.5" PC Drive Bay Inserts for Serial Displays

Our PC Drive Bays come pre-assembled - all you need is a Philips screwdriver to install it in your computer. We provide complete PC Drive Bay kits, which include a LCD or VFD module, PC Bay Insert, Screws, Serial and Power cables, Software and online Manual.

Product	Description	Options	Module	Color	Picture
BGK19264A-BK	This unit fits into a 1U opening. It comes with the mounting bracket and the communication and power cable. **Interface:** RS232/TTL/I2C/USB	-FGW -WB -YG -TCI	GLK19264-7T-1U-FGW GLK19264-7T-1U-WB GLK19264-7T-1U-YG GLK19264-7T-1U-TCI	Black	
BGK24064R-BK	This unit fits into a 1U opening. It comes with the mounting bracket and the communication and power cable. **Interface:** RS232/TTL/I2C/USB	-FGW -WB -TCI	GLK24064-16-1U-FGW GLK24064-16-1U-WB GLK24064-16-1U-TCI	Black	
BLC2021-AL BLC2021-BK BLC2021-BL	Fits into a single height 5-1/4" drive bay. It comes with the mounting bracket, 12V power cable and 4ft serial cable.	-GW -WB -R -IY -FY -FA -FG -FB -FW	LK202-25 LK202-25-GW LK202-25-WB LK202-25-R LK202-25-IY LK202-25-FY LK202-25-FA LK202-25-FG LK202-25-FB LK202-25-FW	Beige Silver Aluminum Black Lexan Black Aluminum	
BLC2041(-USB) BLC2041-AL (-USB) BLC2041-BK (-USB) BLC2041-BL(-USB)	Fits into a double height 5-1/4" drive bay. It comes with the mounting bracket, 12V power cable and 4ft serial cable.	-GW -WB -R -IY	LK204-25(-USB) LK204-25(-USB)-GW LK204-25(-USB)-WB LK204-25(-USB)-R LK204-25-IY	Beige Black Lexan Black/Silver Aluminum	
BLK202A(-USB) BLK202A-BK(-USB) BLK202A-S(-USB)	Fits into a single height 5-1/4" drive bay. It comes with the mounting bracket, 12V power cable and 4ft serial cable.	-WB -GW -R -IY -FY -FA -FG -FB -FW	LK202-25(-USB) LK202-25(-USB)-WB LK202-25(-USB)-GW LK202-25(-USB)-R LK202-25(-USB)-IY LK202-25(-USB)-FY LK202-25(-USB)-FA LK202-25(-USB)-FG LK202-25(-USB)-FB LK202-25(-USB)-FW	Beige Black Silver	
BLK204-7T-1U-BK	Fits into a 1U opening. It comes with the mounting bracket and the communication and power cable.	-YG -WB -GW -TCI	LK204-7T-1U-YG LK204-7T-1U-WB LK204-7T-1U-GW LK204-7T-1U-TCI	Black	
BLK204A BLK204A-BK	Fits into a double height 5-1/4" drive bay. It comes with the mounting bracket, 12V power cable and 4ft serial cable.	-GW -IY -R -WB	LK204-25 LK204-25-GW LK204-25-IY LK204-25-R LK204-25-WB	Beige Black	
BVC2021-AL BVC2021-BK	Fits into a 1U opening. It comes with the mounting bracket, 12V power cable and 4ft serial cable.		VK202-25	Silver Aluminum Black Lexan	
BVK202A BVK202A-BK BVK202A-S	Fits into a 1U opening. It comes with the mounting bracket, 12V power cable and 4ft serial cable.		VK202-25	Beige Black Silver	
BLC2021-AL-USB BLC2021-BK-USB BLC2021-BL-USB	Fits into a 1U opening. It comes with the mounting bracket and External Mini USB cable.	-GW -WB -R -IY -FY -FA -FG -FB -FW	LK202-25-USB LK202-25-USB-GW LK202-25-USB-WB LK202-25-USB-R LK202-25-USB-IY LK202-25-USB-FY LK202-25-USB-FA LK202-25-USB-FG LK202-25-USB-FB LK202-25-USB-FW	Silver Aluminum Black Lexan Black Aluminum	
BLK204-7T-1U-BK-USB	Fits into a 1U opening. It comes with the mounting bracket and 3ft A to B Mini USB.	-YG -WB -GW -TCI	LK204-7T-1U-USB-YG LK204-7T-1U-USB-WB LK204-7T-1U-USB-GW LK204-7T-1U-USB-TCI	Black	
BLK204A-BK-USB BLK204A-USB	Fits into a double height 5-1/4" drive bay. It comes with the mounting bracket and External Mini USB cable.	-GW -WB -R	LK204-25-USB LK204-25-USB-GW LK204-25-USB-WB LK204-25-USB-R	Black Beige	

Warranty

BiPOM Electronics offers a 30-day money-back warranty on standard microcontroller boards. Other products, boards that are customized by BiPOM Electronics for a particular use and any product that has been modified by the customer (including the microcontroller boards) can not be returned.

BiPOM Electronics offers a three-year warranty on most electronic products. Products that prove to be defective within the two year period will be repaired (with new full warranty) or replaced at BiPOM's option. This warranty does not apply to products which have been subject to neglect, accident, misuse (including static discharge) or modification. In no event shall the liability of BiPOM Electronics exceed the buyer's purchase price nor shall BiPOM Electronics be liable for any consequential or indirect damages.

Warning

BiPOM Electronics makes no representation that the products described in this catalog are suitable for a particular use. The user must make the final determination for fitness to a particular use or application.

Products sold by BiPOM Electronics are not authorized for use as critical components in life support or safety of flight devices or systems. A critical component is any component of a life support or safety of flight device or system whose failure to perform can be reasonably expected to cause the failure of the life support or safety of flight device or system, or to affect its safety or effectiveness. Safety of flight qualification is the responsibility of the buyer.

Printed in the USA