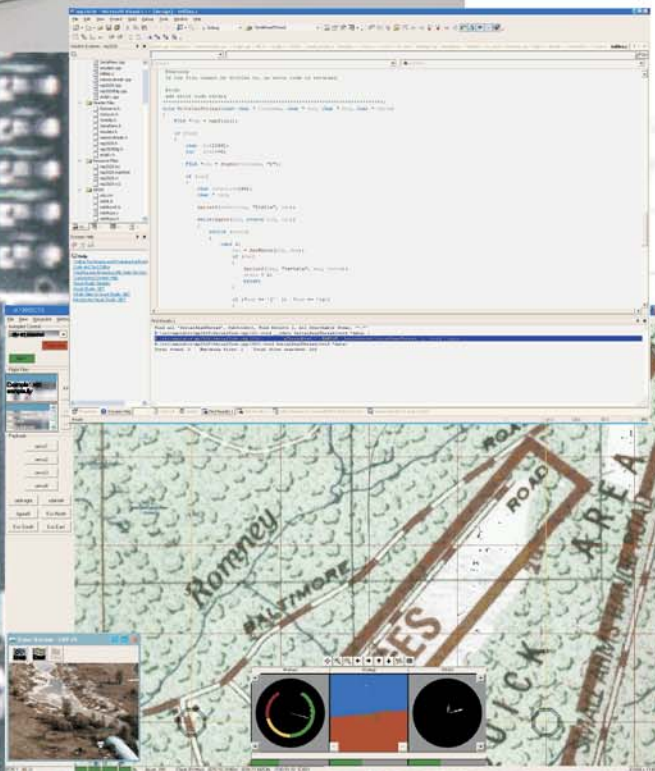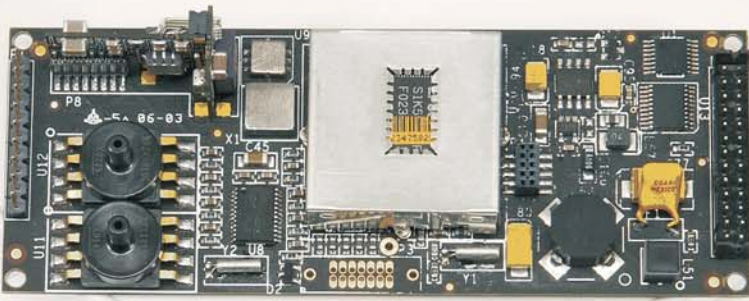# XTENDER^{mp}
Software Developer's Kit

MINIATURE UAV AUTOPILOTS

The **XTENDER^{mp}** software developer's kit takes the MicroPilot brand of autopilots to a whole new level. This powerful SDK is the key to differentiating your product from the competition. The **XTENDER^{mp}** taps into the power of a world recognized autopilot and expands it to fill the gap between standard autopilot functionality and your specific requirements.

FEATURE RICH

- ability to customize control laws for enhanced control of your airframe
- allows you to use custom software that communicates to the MP2028^g through the HORIZON^{mp}
- ability to write custom GCS
- extends the HORIZON^{mp} to accept third party software that can access autopilot data (e.g. vision software)
- extends the autopilot to control custom payloads and collect data from custom sensors
- autopilot 6DOF simulator allows you to test your code on the bench to dramatically reduce risk and increase productivity
- allows for complete access to the autopilot state for enhanced control

MicroPilot ™

SIZE MATTERS

API

The **XTENDER**mp SDK provides a flexible set of functions that allow the developer to easily design software that interacts with the autopilot.

- Integrated autopilot simulator speeds development of customer's software and provides training mode to simplify software roll out
- Identical API's used to connect to simulated autopilot and real autopilot
- Thread safe, multi-threaded re-entrant API's
- API's provide access to all autopilot state information
- Windows and Linux versions available
- Compatible with any development language that supports Windows DLL (e.g. Visual Basic, VB, Borland Builder)
- API functions include:
  - Transmit commands to autopilot
  - Transmit configuration settings to autopilot
  - Set individual configuration parameter
  - Retrieve multiple state fields
  - Move waypoints in-flight
  - Start / stop holding patterns
  - Start / stop threads
  - Reprogram commands in-flight
  - Initiate simulated failures
  - Capture user telemetry
  - Retrieve standard and user defined telemetry
  - Change flight mode UAV, RPV

COMMUNICATIONS

The **XTENDER**mp SDK implements a flexible and functional communications topology.

- Allows full control of a MicroPilot autopilot connected either directly to the PC's serial port or via radio modem.
- Integrated TCP/IP server extends autopilot APIs across any low latency TCP/IP network allowing applications to communicate with remotely connected MicroPilot autopilots
- Access to locally connected and remotely connected autopilots is fully transparent to the application
- Multiple processes can communicate with a single MicroPilot autopilot
- A single process can communicate with multiple MicroPilot autopilots
- Customer applications and Horizon can communicate with a MicroPilot autopilot simultaneously over the same com link

VIDEO

The **XTENDER**mp SDK also includes a video API

- Support any Windows media video source device USB, PCI, Firewire (IEEE 1394), PCMCIA
- Frame and resolution automatically set from capture device rate
- Still and video snapshots
- Video snapshots consume only minimal CPU resources
- Video recorded in MPEG4 Windows Media format
- Snapshots include automatically generated world file
- Display video from multiple UAVs simultaneously limited only by processor power
- Telemetry logs indexed by time and video frame number

TOOLS

The **XTENDER**mp SDK includes the following developer's tools:

- GNU source level debugger
- Parallel port BDM probe
- GNU C compiler
- CYGWIN Tool set

Specifications
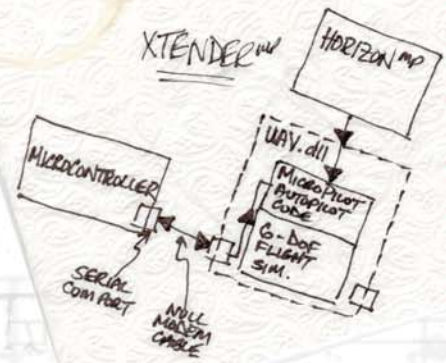
MicroPilot PLUG IN's

MP Plug-In's are code modules that execute at the same time as the autopilot code and allow customer's to add functionality to the autopilot to differentiate their products and close the gap between the standard autopilot functionality and their custom requirements.

- MP Plug-ins can access 64K Ram for data and 64K Flash for code
- MP Plug-ins run under the autopilot simulator to simplify testing and speed development
- MP Plug-ins can access all autopilot state fields
- MP Plug-ins can provide customer specific servo mixing
- Customer defined control laws can replace any or all existing MP2028⁹ control laws
- MicroPilot Plug-in's can access unused autopilot hardware for custom payload control and data collection
- Up to 9 I/O channels are available for MicroPilot Plug-in's. Each I/O channel can be configured as one of: Serial input, Serial output, PWM in, PWM out, single bit input or single bit output

SIMULATOR

The **XTENDER**mp includes a "software in the loop" 6-DOF simulator linked to autopilot code.

- Simulator update rate 150 Hz
- Accepts autopilot commands via PC serial port speeds development of embedded payload / mission controllers
- Simulates communication, engine failure, loss of GPS lock, loss of RC signal, loss of communications and low battery failures
- Availability of simulator gives end-product training mode

REQUIREMENTS

The system requirements for the **XTENDER**mp are:

- Windows 98, ME, 2000, XP
- 1 GB free disk space
- 256 MB Ram or 512 MB Ram if video enabled
- 500 MHz Pentium II or 1 GHz Pentium III if video enabled
- Hardware Parallel Port for BDM probe
- Low latency network
- Supports any Windows Media video source device USB, PCI, Firewire (IEEE 1394)
- Linux API requires Mandrake 9.2 on Intelx86 or strong arm processor
- MicroPilot MP2028⁹ Autopilot

MicroPilot ™

SIZE MATTERS