

ALPR

Automatic License Plate Recognition solution



An ALPR system from Motorola and PIPS Technology (a Federal Signal Company) acts as a silent partner in the vehicle, constantly scanning license plates of passed vehicles. When a vehicle of interest is passed, the system can alert the officer and record the time and GPS coordinates when the encounter happened.

The system can check several thousand plates in a single shift – far more than the 50-100 typically checked using manual processes. This greatly increases the odds that vehicles of interest will be spotted and found. Police and other agencies have found many uses for an ALPR system:

- Combating auto theft and related crimes
- Collecting revenue from ticket scofflaws
- Intelligence gathering and crime-pattern analysis
- Monitoring felons and other persons of interest
- Reducing claims of profiling
- Perimeter security around sensitive areas like airports and schools

Motorola, the leader in public-safety communications and mobile computing, and PIPS Technology, the

leader in license-plate recognition systems, bring you a unique ALPR solution with the following features:

- High-accuracy ALPR hardware and software
- Operation without a separate ALPR processor box in the trunk
- Support for conducting surveillance under varied lighting conditions, from a bright, sunny afternoon to a dark, rainy night
- Ability to capture license plates even when two vehicles pass each other at highway speeds (up to 130 mph differential speed)
- Low-profile cameras that do not interfere with the light bar

An ALPR system from Motorola and PIPS consists of the following components:

- Up to four low-profile, digital Slate™ cameras
- PIPS PAGIS® software
- Motorola MW810 Mobile Workstation
- Motorola MW810 ALPR Expansion Board
- PIPS BOSS® software

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SLATE™ CAMERAS

The rugged, low-profile Slate digital camera from PIPS supports both color and infrared image capture. Designed to fit under the light bar, it will not block the light bar from any angle. Slate cameras offer the following patented technologies:

- **TripleFlash®:** Varies the flash, shutter and gain settings of the camera to capture three plate images. Only the image determined to produce the highest quality read is sent on for processing, ensuring optimum performance regardless of light or weather conditions.
- **PlateFinder:** Sophisticated firmware continually searches the camera's field of view for the presence of a license plate.

Dimensions (W x D x H)	7.16 in. x 3.54 in. x 1.65 in. (182 mm x 90 mm x 42 mm)
Weight	Less than 3.31 lbs (1.5 kg)
Mechanics	Extruded metal casting with piston sealed lens
Optics	Clear IR-transmissive front window Integral band-pass filter (IR camera) Integral IR-cut filter (color camera) Available lenses (mm): 25, 12, 8, 7, 6, 4.9, 4, and 2.9
Focal Lengths	Short: 8 mm IR / 6 mm color overview Long: 25 mm IR / 12 mm color overview
Illumination	High-power IR pulsed illuminator. TripleFlash illumination (patented). Flash table can include a position for the color overview camera with LEDs turned off The illuminator flash table runs locally and autonomously on power-up and can be set via an interactive PC graphical utility or via a simple command-line text interface. Effective viewing range: up to 50 feet (15 meters)
IR Wavelengths	810 nm or 950 nm, depending on jurisdiction
Monochrome	IR camera Hi-sensitivity IR CCD 752 x 582 (CCIR) or 768 x 494 (EIA) ¼-inch format
Color Camera	Exview-HADTM Color CCD 752x582 (PAL) or 768 x 494 (NTSC) ¼-inch format Separate day / night settings (for high-speed applications) with changeover from built-in photo sensor
Video Input	Separate 75 ohm standard video output for infrared monochrome and for color Both cameras can be multiplexed to one output controlled by the flash table
Synchronization	External video sync input; otherwise crystal-controlled internal sync (both cameras locked together)
Control	No external controller required; graphical or command-line interface control of video-field table; flash (8 settings); gain (8 settings); shutter (4 settings); camera selection (2 settings) under RS 232 control; table depth, up to 8 manual/auto-table (On/Off), plus engineering-only access to camera DSP internal settings, e.g. horizontal and vertical aperture correction, Gamma, etc.
Communications	RS232 & RS485, Rx, Tx, Gnd, 19.2kB, 8 bits, no-parity, 1 stop-bit Flash-table index encoded in top left-hand corner of image
Cable	MW810 ALPR Splitter Cable (required; sold separately) connects the ALPR expansion board with up to four SLATE Digital ALPR cameras via camera cables. Splitter cable is designed to the same ruggedness specifications as the MW810 Mobile Workstation. (See page 3.) Camera cables: DVI 36 Pin to 50 Pin ALPR 5 ft. (1.5 m) DVI 36 Pin to 50 Pin ALPR 9.8 ft. (3 m) DVI 36 Pin to 50 Pin ALPR 16.4 ft. (5 m)
Connectors	Metal IP67-sealed connectors
Connections	75 ohm standard video (infrared monochrome and color); power supply (+ve/-ve); RS 232/RS485 communications; camera and overall screens; external sync, flash gnd and flash pulse
Mounting	Three-axis finger mounting bracket
Operating Temperature	-4°F to +140°F (-20°C to +60°C)
Regulatory Compliance	US Safety: UL-60950-1 US Radiation Emission: FCC Part 15, Class B Compliant with EPP, RoHS, and WEEE



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PAGIS® SOFTWARE

PAGIS (Police ALPR Graphical Interface System) is a patrol-car based license plate recognition software improving officer safety and effectiveness:

- Capture and decode a license plate, identification plates of interest, and alert users in less than two seconds
- PIPS Technology's proprietary, high-accuracy ALPR software with optical character recognition (OCR)
- OCR optimized for the customer's state or jurisdiction
- Vehicle color image capture for evidentiary purposes
- Support for wireless database synchronization
- Easy interface designed by public safety for public safety

MOTOROLA MW810 MOBILE WORKSTATION

The fully rugged Motorola MW810 Mobile Workstation provides reliable, cost-effective wireless connectivity and computing power for mission-critical applications. Its three-piece design allows flexible installation options, including choice and location of CPU, display, and backlit keyboards. This fixed-mount, high-performance computing platform is optimized for harsh environments and seamless mobility at highway speeds.

MW810 displays are full of user-friendly features. All of them come with resistive tempered glass touchscreens and have user-programmable function buttons with available custom labeling. An emergency button can work with dispatch and monitoring applications to allow users to call for help without keyboard or radio.



COMPUTER

Processor Options	Intel® Core™2 Duo (Merom) T7400 4 MB L2 2.16 GHz 667 MHz (Option) Intel Core 2 Duo (Merom) T5500 2 MB L2 1.66 GHz 667 MHz (Standard) Intel Celeron® M 430 1 MB L2 1.73 GHz 533 MHz (Option)
Chipset	Intel 945GM
Video Controller	Integrated in Intel 945GM Chipset. Dynamic allocation from 64 MB up to 224 MB RAM
Internal Memory	1 GB Standard, 4 GB Maximum (Total usable memory will be less, depending on configuration)
Mass Storage Options	Heated Removable 80 GB (standard) or 120 GB Hard Drive with 3-dimensional shock absorber 32 GB or 64 GB Solid State Drive (Option, replaces Hard Drive)
Security and Protection	TPM 1.2 (Trusted Platform Module) integrated in CPU. Optional internal Smart Card Reader available in 12.1" displays.
Operating System	Microsoft® Windows Vista® Business Edition, SP1 (32 bit), with downgrade rights to Windows® XP Professional, SP2

INTERNAL RADIO OPTIONS AND COMMUNICATIONS PORTS

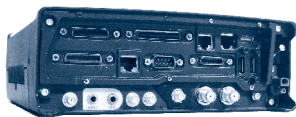
WLAN	Choose 802.11 a/b/g or 802.11 a/b/g/n
WWAN	CDMA EVDO Rev. A or HSDPA/UTMS/EDGE/GPRS
GPS (optional)	Position output in NMEA 0183, TSIP, TAIP, and DGPS protocols
Dead-Reckoning GPS (optional)	Increases GPS accuracy in areas where satellite connectivity is poor. Position output in NMEA 0183 and UBX protocols.

ENVIRONMENTAL AND DURABILITY

Operating Temperature	-22°F to +158°F (-30°C to +70°C)
Storage Temperature	-40°F to +158°F (-40°C to +70°C)
Humidity	90 to 95% relative humidity at 50 degrees C after 8 hours, per TIA/EIA 603
Sealing	IEC IP-54 Rating. "5" = Dust protected. "4" = Protected against splashing water
Shock	20g peak 1/2 sine wave @ 11ms, 30 impacts per TIA/EIA 603 Paragraph 3.3.5
Vibration	Per TIA/EIA 603 Paragraph 3.3.4 and MILSTD-810F Method 514.5, Fig. 514.5C-1
Drip	Per MILSTD-810F Method 506.4 Procedure III
Dust	Blowing 5 hours in dust (140 mesh silica flour) laden atmosphere; dust agitation time is for 2 seconds every 15 minutes
Salt Fog	8 hours, 5% Sodium Chloride at 35 degrees C, per MILSTD-810F Method 509.4
Flammability	Per UL94
Solar Radiation	7 cycles of 24 hours with no functional degradation per MILSTD-810F Method 505.4, Procedure I
Shock Crash Hazard	75g, 6 ms per MILSTD-810F Method 516.5, Procedure V
WARRANTY	3 year commercial warranty standard

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MOTOROLA ALPR EXPANSION BOARD FOR MW810 MOBILE WORKSTATION

The MW810 ALPR Expansion board is an add-on board that can be installed in an MW810 Mobile Workstation. The board has an interface that allows it to connect to up to four Slate™ digital cameras, eliminating the need for a separate ALPR processor. The board also has a built-in proprietary interface with intelligence that helps pre-process data from Slate cameras, reducing the load on the MW810's main processor.

Ports	One high-density MDR-compatible port (with suitable pin configuration) that supports connectivity with up to four (4) PIPS Slate™ ALPR digital cameras. One USB 2.0 port One 1 Gigabit Ethernet LAN port One 10/100 Mbps Ethernet LAN port One DVI 36 pin, MDR compatible port for secondary display
Installation Options	The MW810 ALPR Expansion board can be ordered as part of a new MW810 Mobile Workstation. It can also be purchased separately and retrofitted at the depot to an MW810 Mobile Workstation that is already installed in the vehicle.
Cables	MW810 ALPR Splitter Cable (required; sold separately) connects the ALPR expansion board with up to four Slate Digital ALPR cameras via camera cables. Splitter cable is designed to the same ruggedness specifications as the MW810 Mobile Workstation. (See previous page.) Camera cables: DVI 36 Pin to 50 Pin ALPR 5 ft. (1.5 m) DVI 36 Pin to 50 Pin ALPR 9.8 ft. (3 m) DVI 36 Pin to 50 Pin ALPR 16.4 ft. (5 m)
Environmental	The MW810 ALPR Expansion Board is designed to the same ruggedness standards as the MW810 Mobile Workstation (see previous page) and passes the same tests.
Warranty	3 year commercial warranty standard



BACK OFFICE SYSTEM SERVER (BOSS®) SOFTWARE

The BOSS Back Office System Server provides administrative and data analysis functions for both mobile and fixed deployments of ALPR, and serves as a central repository where all data may reside and be used as a total population. BOSS was specifically designed to allow law enforcement to capitalize on the tremendous amount of data generated by PAGIS (for mobile applications) and Spike+™, the integrated camera/processor system for fixed applications.

BOSS includes Administration utilities for PAGIS and BOSS allowing customization of screens, setup of users, and specification of databases to compare against. Perhaps the most powerful application of BOSS is its data mining capability, which allows customers to locate and map hits based on a wide range of criteria including partial plates, street address, GPS coordinates, time and date.



MOTOROLA

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