

M110 Access Point



Clearview's M100 wireless vehicle detection system uses in ground magnetometer sensors to detect the presence and movement of vehicles and bicycles. The magnetometer sensors are wireless, transmitting their detection data in real-time via low-power radio technology to a nearby M110 Access Point that relays the data to one or more local or remote traffic management controllers and systems.

Our 2nd generation M110 access point operates under the Linux platform to maintain two-way wireless links to system sensors and repeaters, establish overall time synchronisation, transmit configuration commands / message acknowledgements and receive / process data from the sensors. The M110 relays the sensor detection data to a roadside traffic controller or remote server, traffic management system or other vehicle detection application.

The M110 Access Point includes a higher sensitivity radio for improved robust wireless links alongside greater processing and memory capacity for additional applications. Upgraded housing provides excellent protection against the environment in all weather conditions.

Functions / Features

Radio communications to and from wireless sensors and repeater units

Relay of sensor data:

- Via contact closure signals or Ethernet interface to traffic controller
- Via IP connectivity (wired or wireless) to traffic management systems, upstream servers etc

Processing of sensor data:

- Per-lane or per-vehicle data
- Data binning over selectable time intervals
- Data filtering (e.g. adaptive holder)

Storage of sensor data:

- Data buffering (event caching)
- Data storage (processed data)

Master time base for all supported wireless sensors

- Common clock for sensor timestamps
- Can be synchronised to NIST timing signals

Radio signal quality measurements

- Receive signal strength indicator (RSSI in dBm)
- Link quality index (LQI, figure of merit 40-99)

Firmware upgrades

- Upgrades via IP connectivity or via local PC connection
- Delivers upgrades to all other system devices

Simple installation

- Any roadside location that provides adequate signal coverage to sensors/repeaters
- No special requirements regarding setback or mounting stability
- To be mounted at 4.5m – 6m in height up to a distance of 35m away from in-ground M100 sensors

Enclosure

- Enclosure provides excellent protection against the environment through a ventilation membrane

Software compatibility

- Requires TrafficDOT software 2.12.7 or later

Functional Specifications

Interfaces	To/from sensors via 802.15.4 PHY radio. To/from repeaters via 802.15.4 PHY radio. To/from configuration device (PC) via TCP/IP over 10/100Base-T Ethernet. To roadside traffic controller via contact closure, SDLC link or Ethernet interface.
IP connectivity	Telnet, FTP, HTTP, PPP, PPTP, optional encryption over tunnel 10/100Base-T via RJ45 connector
Per-lane data processing	Counts (volume) / Occupancy / Average & Median Speeds / Binned speeds & vehicle lengths
Per-lane vehicle length data processing	Initial detect time / gap / speed /
Memory Resources	-500kB for event caching / 1MB for processed data storage
Processor	400 MHz ARM9 processor / Linux 3.14 operating system / 256MB Flash / 128 MB SDRAM
Over-the-air protocol	Custom TDMA protocol
Physical layer protocol	IEEE 802.15.4 PHY
Modulation	Direct sequence spread spectrum offset quadrature phase shift keying (DSSSO-QPSK)
Transmit/receive bit rate	250 kbps
Frequency band	2400 to 2483.5 MHz (ISM unlicensed band)
Frequency channels	16
Channel bandwidth	2 MHz
Antenna type	Microstrip patch antenna (side with toward sensors label)
Antenna field of view	+60 degrees (azimuth & elevation)

Nominal output power	+3 dBm
Typical receive sensitivity	-101 dBm (PER < 1%)
Saturation (Max input level)	> 10 dBm

Power, Physical & Environment

Input Voltage	Via POE cable to RJ45 connector 36-58 VDC (48 VDC nominal)
Power Consumption	All access point models; 2W
Dimensions	9" x 4.8" x 3.8" / 22.8cm x 12.1cm x 9.6cm
Weight	1.6 lb (0.7 Kg) Mounting kit: add 1.2 lbs (0.5 Kg)
Environmental operation	Designed for weatherproof, outdoor NEMA type 4 enclosure IP67 ingress protection
Operating Temperature	-40°F to +176°F / -40°C to +80°C
Installation	4.5m to 6m in height, up to 35m away from in-ground M100 sensors

Compliance

Safety	2014/35/EU
RF	2014/53/EU
EMC	2014/30/EU