

1 Description of circuit functionalities.

1.1 Presence detector.

The main function of this device is to detect the presence of stopped vehicles at the stop bar at traffic lights (as an alternative for loop detectors!)

Therefore the unit is equipped with a CMOS camera sensor for image capturing and a microprocessor for the image processing and for running the detection algorithms.

Up to eight detection zones can be configured per unit.

1.2 Communication interface.

The status (occupied or non-occupied) of the configured detection zones is polled by the “4TI-Trafficam-interface” (see §9.1) by means of either: a) a RS485 wired communications link or either: b) a 915MHz RF communication link. Therefore each TrafiCam Wireless sensor has a wireless transceiver from Radiotronics corp. (type Wi.232FHSS250-R) integrated and is equipped with a custom designed 0dBi omnipole antennae. This “4TI” is the interface between the traffic light controller and the TrafiCam sensor.

1.3 Power Supply.

The TrafiCam wireless sensor can be fed with 20-26VAC or DC.

After proper protective and filtering circuitry a switched mode power supply converts the input voltage to a 3V3 output voltage powering all main circuits of the unit. A linear regulator makes out of this 3V3 a 1V8 voltage for powering the core of the microprocessor. The power supply is a non-galvanic isolated type. This means that the internal ground plane (one complete layer of the 4-layer PCB board!) is connected to the cold side of the external power supply!

Remark: this ground layer acts also as the ground plane for the antennae!

2 Operational description.

After power-up the microprocessor starts loading its software from external flash. Once this “boot”-sequence is finished, the microprocessor initialises the CMOS sensor over the I2C-bus. From this point on the processor starts collecting images and processes them with the detection algorithms.

The 4TI-interface board then polls the present TrafiCam wireless sensors by sending them a “request status” command.

The TrafiCams Wireless sensor decodes this command and when the address contained in the command matches the address of the Traficam Wireless sensor, it sends its status information back to the 4TI-interface.

With the non-wireless TrafiCam sensor this communication goes over a multi-drop RS485 network.

With the TrafiCam Wireless sensor the communication goes over the 915MHz RF link, which acts in fact as a true wire replacement.

(For a detailed description of the wireless transceiver itself we refer to the technical report of the Radiotronix Wi.232FHSS-250mW module itself. FCC ID = Q7V-3F090009X)