

Tri-Vision Sign Controller (TVSC) Changeable Message Sign Module (CMS)



Tri-vision Signs, also known as Changeable Message Signs, are mechanical multi-faced displays that are made up of a series of panels with three separate sides allowing three individual sign images to be displayed instead of one. Tri-vision signs use a controller module to electronically regulate in which order the traffic sign facings are displayed as well as the facing time. The TVS controller can be programmed either on-site or remotely to rotate the separate faces so that one whole image is viewed at user specified time intervals. A small low-wattage high-speed reduction motor powered by the sign controller, rotates the TVS sign panels in any designated sequence. The Tri-vision sign controller incorporates current overload protection and an option battery backup for safety fallback if supply power fails.



Features

- Tri-Vision sign controllers allow up to 3 different display images per sign
- Controlled either locally on-site or remotely via a serial communication radio-link (RS422 pair), control software maybe used to control the message times and direction selection
 - for easy and convenient traffic sign adjustment
- Forward and backward sign rotation – for fast selection of desired display face
- Adjustable time in between sign facing change, increments of 1/10 of a second
 - allows for user specification on how long each traffic sign is viewed by motorist
- The TVS control card maybe configured into a multi-drop wiring topography through encoding a unique control card address with a multidrop RS422 local data network.
- Tri-Vision sign controllers allow traffic signs to be more cost-effective with multi-faced message potential
- Optional Power supply failure – automatically fall back to battery powered selection of pre-set display face upon supply failure
- Automatic shutdown when current overload is detected – protects motor and circuitry if the sign has a mechanical stall or seizure.





General Specification

Physical

- Weight: < 0.24 Kg
- Operational temperature: 65 degrees 90% humidity
- Circuit card size: 130 mm x 175 mm x 30 mm
- Circuit cards are conformal coated and will operate within Australian Standard Guidelines for Traffic Control Devices as per TSC/3 and TSC/4
 - The conformal coating material has a dielectric strength of 90 KV/mm and an operational temperature range of -70°C to 200°C and is self-extinguishing when exposed to a flame

Power Supply

- Operational voltage: 32 volt AC
- Current consumption: > 1.0 amps
- Voltage regulation and control is provided by IC2 and SWREG1

Connector Specification

- Easy to connect through PCB modular terminal 'Phoenix style' connectors, 10 amp rated voltage 300 volt AC

Reduction Motor

- TVSC controls a 24 volt DC high speed reduction motor, the circuit card requires a single 32 volt AC supply

Digital I/O

- Output devices: PVAZ172 MOSFET Photovoltaic relay 60 volt 500 milliamp capability
- Inputs are optically isolated by PC844 Opto-isolator 5000 volt RMS isolation devices, input 20 milliamps at 1.2volts
- The operation of the circuit is provided by IC1 – Microprocessor PIC 17C756

Typical Communication Protocol

All command messages, so long as they are not broadcast, cause the device being addressed to respond. If a SET command is received correctly, an ACK message is replied. If the message was invalid a NACK message will be returned instead. No reply is sent for a broadcast message. For request messages, no ACK is set. Rather, the requested data is returned instead.

Command Message Types

Set state – CMS:

Device Type - 'C' (0x43h)
 Message Type - 'S' (0x53h)
 Data - 1 byte

This message commands the CMS to display a new state. It can also toggle the flashing beacon control.

7: X	6: X	5: X	4: FLEN	3: X	2: SST2	1: SST1	0: SST0
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FLEN : Flashing enable: if set, a 24 volt output is driven from the CMS control card for 5 seconds. If this bit is set, the SST bits are ignored.

SST0:2 : Sign State: this is only valid if FLEN is clear.

SST0:2*	Sign State:
0x01	Display 1
0x02	Display 2
0x04	Display 3

For other SST values, the command will be rejected outright and a NAK message will be returned.

Request Status:

Device Type(s) - 'C' (0x43h)
 Message Type - 'R' (0x52h)
 Data - 0 bytes

This command requests the status of the particular device. The broadcast address is not valid for this command. The response is a status message.