



# 2070-6B Dual FSK Modem for 2070 Controllers

## Applications

The 2070-6B Modem facilitates the exchange of data related to traffic signal control between a 2070 Controller and various components in the traffic management system. The 2070 Controller, a widely utilized type of traffic signal controller overseeing traffic light operations, relies on modems like the 2070-6B for seamless communication.

With its dual FSK capabilities, the 2070-6B Modem assumes a pivotal role in ensuring smooth communication across traffic signal controllers and the broader traffic management network. This harmonious communication is essential to maintain the smooth and safe flow of traffic. The 2070 Controller depends on modems like the 2070-6B to transmit and receive crucial data, encompassing real-time traffic conditions, pedestrian crossings, signal timing adjustments, and other pertinent information to optimize traffic signal functionality.

The dual FSK modulation employed by the 2070-6B Modem, utilizing Frequency Shift Keying, entails encoding information in signal frequency. This dual FSK approach, with two distinct frequencies for data transmission, provides potential benefits such as enhanced efficiency and reliability in communication. This redundancy and increased data throughput are especially valuable in challenging conditions, ensuring robust communication that is vital for the overall efficiency and safety of the traffic system.

## Features

- Data Rate: 0 - 9600 bps
- Built with surface mount parts for increased reliability
- Dual FSK modulation for enhanced efficiency and reliability
- Easy installation, plugs into the A1 to A5 slots of a 2070 Controller

## General Description

The 2070-6B Modem is a dual 9600 Baud FSK Modem for the 2070 Controller, which utilizes the latest surface mount technology. The 2070-6B meets or exceeds the CALTRANS Transportation Electrical Equipment Specifications (TEES) of 2009, (TEES 2009 Power Isolation) and applicable addendums. This Modem plugs into the A2 to A5 and A1 slots of the 2070



Controller and is held in place with two thumbscrews. The front panel has two M14 type connectors that are identical to the C2S and C2OS connectors on the 170 Controllers. Therefore, cables made for the 300 series cabinets will work with the 2070-6B.

The 2070-6B also converts the EIA-485 signals for SP1-4 on the back plane of the 2070 to EIA-232. These signals are available in the M14 (C2 and C2O) connectors on the front panel if the Modem sections are not being used. A front panel switch can turn off each section of the Modem individually so that it doesn't interfere with the EIA-232 communication that might be going on.

The front panel of the 2070-6B also has Full Duplex/Half Duplex switches for each channel. A 5th switch powers down the entire Module so that it can be inserted or taken out while the power to the 2070 is on. This prevents glitches to the 2070 controller during insertion or being unplugged.

Six LEDs are also located on the front panel, 3 for each channel. They include Transmit Data (TX), Receive Data (RX), and Carrier Detect (CD).



All of the RS-232 signals in the C2S and C20S connectors are optically isolated from the controller signals, including the FSK portion of the MODEM. All MODEM and Serial Port Power Supplies have been isolated from the 2070 Controller per TEES 2009 requirements. The 5V supply and Ground in the C2S and C20S connectors are isolated and individually fused to provide 100mA external power supply using a solid state PTC to protect the 2070's internal power supply.

The 2070-6B Module is built with surface mount parts for increased reliability and to reduce the size of components. The use of all surface mount parts has allowed us to put all of the parts on a single PC Board. Power and Ground planes prevent crosstalk and isolate the two modems from each other.

The 2070-6B also has an anti-streaming option that can be selected with a dipswitch on the PC Board. Anti-streaming will prevent a remote site from monopolizing the communication path in a multi-drop configuration. Anti-streaming is not normally used on the Master end.

Separate switches also allow the timings on the handshake and modem control signals to be cut in half for faster communications.

## General Characteristics

- Physical: 8.66" x 6.97" x 1.59" (220mm x 177mm x 40.44mm)
- Temperature: -34.6°F to +165.2°F (-37°C to +74°C)
- Humidity: 5 to 95% non-condensing
- Power: 5 V @ 500ma
  - +12V @ 200ma
  - 12V @ 200ma
- Data Rate: 0 - 9600 bps
- Modulation: Phase Coherent FSK
- Data Format: Asynchronous, serial by bit
- Line Interface: Private Metallic wire, 600 Ohm
- Mark Frequency: 11200 Hz +/-1%
- Space Frequency: 17600 Hz +/-1%
- Soft Carrier: 7800 Hz +/-1%
- Receive Sensitivity: 0 to -40 dB
- Output Level: -8 to 0 dB cont. Adj. (set to 0dB)
- CTS Delay: 12 +/-2 ms.
- Rec. Line Signal Detect Time: 8 +/-2ms
- Receive Line Squelch: 6.5 +/-1ms 0ms out
- Soft Carrier Turnoff Time: 10 +/-2ms
- Modem Recovery Time: <22 ms
- Error Rate: <1 in 10<sup>5</sup> @ S/N of 16 dB
- Anti-streaming Time-out: 7 sec.
- Warranty: One-year warranty from the shipment date

- C2 and C20 Pinout
  - Pin A: Audio In
  - Pin B: Audio In
  - Pin C: Audio Out
  - Pin D: +5 VDC
  - Pin E: Audio Out
  - Pin F: NA
  - Pin H: CD
  - Pin J: RTS
  - Pin K: Data In (TXD)
  - Pin L: Data Out (RXD)
  - Pin M: CTS
  - Pin N: DC Gnd #1
  - Pin P: NA
  - Pin R: NA