



FSK MODEM WITH RADIO TRANSMITTER CONTROLS

for Allen-Bradley PLCs

- One slot in A-B Model 1771 I/O chassis
- Push-to-talk contacts for radio transmitter
- Pots for CTS-on & transmitter-off delays
- Short CTS-on delay if transmitter still on
- Test tones by manual or remote control
- Standard Bell and CCITT compatibility
- Switch-selectable mode & transmit levels
- Can be used for phone or twisted pairs

The MARC™ Model 137-002 module is an asynchronous, frequency-shift-keying (FSK), voice-band modem for reliable, long-distance data communication. This modem has special features for convenience and efficiency when used with a separate radio transmitter and receiver. However, it can also be used on a dedicated telephone channel or local twisted-pair cable. Compatibility is assured with other modems using any of four standard operating modes at speeds up to 1200 baud.

The module plugs into one slot in a Model 1771 input-output chassis for an Allen-Bradley PLC (programmable logic controller), deriving its power from the chassis. It is typically used to connect the PLC with one or more other PLCs in a SCADA (supervisory control and data acquisition) system. Connections are via a 15-pin "D" socket and by screw terminals on a plug-in swing arm.

Relay contacts operated by the RTS (request to send) input are provided for keying a radio transmitter via its "push-to-talk" inputs. For optimum efficiency in radio communication, internal potentiometers allow adjustment of delays before returning a CTS (clear to send) signal and for keeping the transmitter on for a short time at the end of the message. A separate, shorter CTS-on adjustment enables faster communications if a second message is ready before the transmitter-off delay expires. For both local and remote troubleshooting, test tones (mark and space) can be sent by toggle switch or by outputs from the PLC.

The modem can be connected in either two-wire or four-wire configuration. Selection of standard operating mode, full or half duplex, frequency equalization, soft turn-off, and transmit level is made by switches located inside the module case.



Since this modem plugs right into the I/O rack of a PLC, there is no need to mount separate modems elsewhere in the vicinity and provide power for them. Besides being more economical and compact, the Model 137-002 improves a communicating PLC installation in terms of simplicity, neatness, and maintainability. It is especially valuable if the PLC is equipped with an uninterruptible power supply (UPS); a separate UPS need not be provided for the modems. User configurability allows adaptation to changing requirements. This modem has

been proven in numerous applications, and the user base is referenceable for inquiries.

There are a number of other MARC products for mounting in an Allen-Bradley I/O chassis. Included are the Model 137-001 modem, the Model 148-001 dual or redundant modem, the Model 166-001 Comm-Master™ SCADA communications controller, and the Model 127-005 Comm-Troller™ protocol adapter. Similar products are also provided for other programmable controllers. Applicable cable assemblies are available.

Specifications

Physical:

Occupies one module slot in an Allen-Bradley Model 1771 I/O Chassis

1.1" W x 10" H x 5.75" D (standard Allen-Bradley module size); metallic shroud like A-B modules

1 pound, 14 ounces

Operating Environment:

0° to 60° Celsius

10% to 90% relative humidity (non-condensing)

Backplane Power Supply Load:

750 mA from 5 V dc

Inputs and outputs:

15-pin "D" connector (DE15S), RS-232 link to unit served (such as communications interface module for Allen-Bradley PLC), with pin functions as follows:

| | | | | |
|--------|-------|-------|-------|-------|
| 1 GND | 2 TXD | 3 RXD | 4 RTS | 5 CTS |
| 6 DSR | 7 GND | 8 DCD | 9 nc | 10 nc |
| 11 DTR | 12 nc | 13 nc | 14 nc | 15 nc |

Screw terminals, 1771-WC swing arm connector:

(4) Transmit pair and receive pair connect to radio transmitter and receiver or phone line, etc. (two 600-ohm line coupling transformers meeting FCC Part 68; patch in parallel for 2-wire applications.)

(2) Relay contacts, on when RTS is on; connect to "push-to-talk" inputs on radio transmitter.

(4) Two optically isolated input pairs controlling "mark" and "space" test tones; use 12 to 36-volt source or sink such as output module of PLC.

Spring-return toggle switch: Hold left for "mark" test tone; hold right for "space" test tone.

LED Indicators (6):

Status of the following signals: RTS, CTS, DTR, DCD, RXD, and TXD.

Potentiometers for Adjustable Delays:

Transmitter hold delay: Approximately 2 to 350 ms quiet interval after RTS goes off before turning off the "push-to-talk" transmitter keying relay

Normal RTS/CTS delay: Approximately 8.3 to 500 ms; applies if keying relay is off when RTS goes on

Short RTS/CTS delay: Approximately 8.3 to 100 ms; applies if keying relay is on when RTS goes on

Switch-Selectable Options:

Operating Mode:

Bell 103/113/108 originate 300 baud full duplex
Bell 103/113/108 answer 300 baud full duplex
Bell 202 1200 baud half duplex
Bell 202 1200 baud half duplex with equalizer
Bell 202 1200 baud full duplex
Bell 202 1200 baud full duplex with equalizer
CCITT V.21 originate 300 baud full duplex
CCITT V.21 answer 300 baud full duplex
CCITT V.23 Mode 1 600 baud half duplex
CCITT V.23 Mode 1 600 baud half dplx, soft turn-off
CCITT V.23 Mode 1 600 baud full duplex
CCITT V.23 Mode 2 1200 baud half duplex
CCITT V.23 Mode 2 1200 baud half dplx, equalizer
CCITT V.23 Mode 2 1200 baud hlf dplx, soft turn-off
CCITT V.23 Mode 2 1200 baud hlf dplx, eq & sft t-o
CCITT V.23 Mode 2 1200 baud full duplex
CCITT V.23 Mode 2 1200 baud full dplx, equalizer

Transmit Level:

From -12 dB to +2 dB in 2-dB increments

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