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Signaling Products

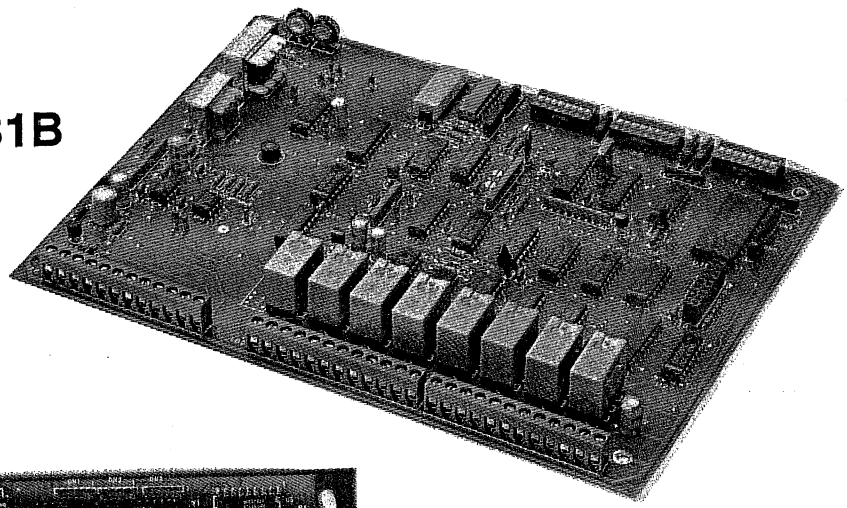
Instruction Manual

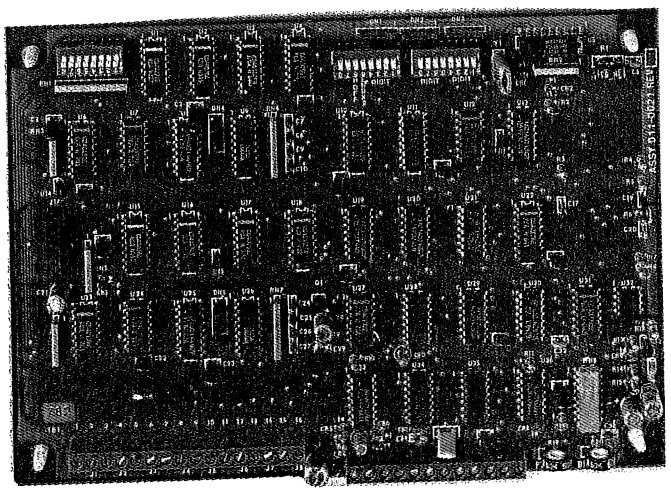
098-0279C

780 Series DTMF Control and Status-Monitoring System

Model DCU-781B DTMF Control Unit (Decoder)
Model DAU-782 DTMF Alarm Unit (Encoder)
Model DRU-783B Remote System (Encoder/Decoder)

DCU-781B





DAU-782

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Introduction

The Vega 780 Series DTMF control and status-reporting system provides remote control and/or remote alarms over any voice-grade transmission medium, such as a radio link, leased line, or microwave, by decoding or encoding DTMF messages.

DTMF control messages may be generated by a DTMF keypad or by a Model I-733 DTMF modem used in conjunction with a personal computer.

The Model DCU-781B DTMF control unit (decoder) provides remote control of up to eight outputs (eight 1-of-N, eight momentary, eight accumulator or ON only with a master reset, or four ON/OFF). DTMF answerback regeneration verifies all received messages.

The Model DAU-782 DTMF alarm unit provides eight inputs for remote alarm or status change. The DTMF alarm/status messages generated by the DAU-782 encoder may be decoded and displayed by a computer equipped with a Model I-733 DTMF modem.

The Model DRU-783B remote system combines the DCU-781B decoder with the DAU-782 encoder to provide remote control of eight outputs, verification that commands have been received and have activated a function, indication of the ON/OFF status of the eight controlled outputs, and interrogation of eight alarm/status inputs by decoding incoming DTMF commands and generating outgoing DTMF messages. The system can also automatically report alarm inputs.

The Model P-780 case is an optional metal enclosure for the DCU-781B, DAU-782, or DRU-783B.

DCU-781B—General

The Vega Model DCU-781B DTMF control unit (decoder) provides up to eight outputs—either open collector or optional plug-in SPDT relays. This unit may be DIP-switch programmed for either a three- or four-digit address. Digits "1" through "8" determine the selected output.

Upon decode of a valid DTMF message, the command is executed and an answerback message is generated. This message is actually a repeat of the DTMF message received and is provided as a verification that the command was received.

The eight outputs are DIP-switch programmable for 1-of-N interlock, momentary, set/reset paired interlock, or "accumulator" (ON-only) modes of operation. In any mode, the address followed by "0" resets all outputs. The first four and the last four outputs are separately programmable for ON/OFF paired interlock or "accumulator" (ON-only) modes. However, the 1-of-N and momentary modes must be 1-of-8.

A push-to-talk (PTT) output is provided to key a transmitter. A carrier-operated-relay input is provided to prevent accidental simultaneous transmission on a shared radio channel. The DCU-781B will also operate over a two-wire or four-wire voice-grade 600-ohm line. The radio channel or voice-grade line need not be dedicated and may be used for voice communications and multiple 780 Series installations. System failure is possible, however, should inadvertent simultaneous transmission occur either on a radio channel or on a wire line.

Provision has been made for an optional rechargeable battery to retain output status (memory only) during power failures. However, relays and LEDs are not energized by the back-up battery connected to these terminals.

Provision has also been made to operate multiple DCU-781B decoders in a single 1-of-N mode, when more than eight outputs are required.

The DIP-switch-programmable station address may be either three or four digits long. Any of the 16 DTMF characters may be used. Control digits "1" through "8" are then added after the address to control the associated output (one through eight). Control digit "0" resets all outputs to the "OFF" position. This results in a total message length of either four (three address plus one control) or five (four address plus one control) digits.

Lightning Protection (All Models)

Line inputs and outputs are diode-protected from line transients up to certain limitations. Protection from lightning-induced high voltage and current has not been provided. Vega does not provide repair under warranty for damage obviously caused by high voltages.

If the line is leased from a telephone company, lightning protection is usually provided at the line entrance to the building. (Verify with your telephone company.) If this protection is not provided, or if the system is to be used on a private, customer-owned line, it is recommended that a North Supply part # S-561034 or equal lightning-protection device be installed and properly grounded at the entrance to the building. It is also recommended that gas-discharge units such as North Supply part # S-568015 or MOV devices such as GE part # V100ZA15 be installed directly at the line terminals of all 780 Series models.

DCU-781B Installation and Setup

Refer to the DCU-781B schematic, PC-board silk screen, and the Installation and Setup Chart located in this manual and on the label on the inside of the P-780 cover. DIP-switch program the station address, output interlock, wrong-digit operation, and answerback ON/OFF.

As shipped, the DCU-781B is programmed for radio or four-wire-line operation with answerback. (J9 and J10 should be open, and J1 closed.) For two-wire line operation, close J9 and J10 and open J1.

For radio operation, receiver audio is connected to TB1-1,2 and transmit audio is obtained from TB1-3,4. If the radio speaker output and the microphone input are used, attenuator pads should be installed to reduce the maximum input to about 0 dBm and maximum output to about –15 dBm. TB1-7 connects to the radio PTT circuit and TB1-5 connects to the radio carrier-operated relay (COR) output. Carrier detection grounds TB1-5 and "holds off" answerback until the channel is clear.

As shipped, the DCU-781B DTMF inputs are programmed for –20 to +10 dBm, 1/3 to 10 digits per second, 50% duty factor. For –40 to –10 dBm input, close J2. For 11 to 22 digits per second (50% duty factor), close J4. For DTMF with a fixed 15-ms interdigit time, close J3 and J4.

Factory programming is for open-collector output operation. When the optional SPDT relays are used, remove the jumper wires from the relay sockets, close J5, and plug in the relays. If a mixture of open-collector and relay outputs are used and the external circuits operate from a higher supply voltage than the DCU-781B, J5 must be open and individual diodes must be reverse-connected across all relay coils.

Adjust R28 for the desired answerback level (usually 0 dBm on a 600-ohm line and about at voice peak level into a radio transmitter. Answerback digit rate is factory adjusted to 10 digits per second. Adjust R1 for a different digit rate. Adjust the interdigit timer to minimum if only 10 digits-per-second automatic encoding is used and to maximum if manual keypad encoding is always or sometimes used.

DAU-782 – General

The DAU-782 is a DTMF alarm/status-change reporting device. The report is a four-digit DTMF message which may be transmitted via any voice-grade transmission medium such as a microwave circuit, radio links, leased line, or audio pair.

A radio channel may be used both for voice communications and for alarm reporting from one or more locations. The DAU-782 provides push-to-talk (PTT) output to operate the transmitter, and a carrier-operated relay (COR) input to "hold off" alarm messages until the channel is clear. Use of voice or multiple DAU-782 units on a single 600-ohm line requires external sensing of line activity to hold off alarms until the line is clear.

DIP-switch programming of the first three DTMF digits (address) is provided. The fourth digit always corresponds to the number of the activated input.

Each alarm may be programmed to be sent once or twice. The input is then disabled and will not be sent again until the alarm input is removed and reapplied.

An inhibit/trigger-status input is provided. This can be used for time-clock or special-circumstances reporting of all alarms present. A trigger from this input causes the alarm messages to be sent only once, regardless of the send-twice programming.

Reapplication of power after a loss automatically causes all alarms present to be reported.

DAU-782 Installation and Setup

Refer to the DAU-782 schematic, PC-board silk screen, and the Installation and Setup Chart or the label located inside the P-780 cover. Program the three-digit DTMF address of the four-digit message. Select an "odd" number for the third digit. NOTE: An "even" number in the third-digit position will cause the third digit plus one to be generated. For example, if the programmed address is "1-2-4-X", then the message "1-2-5-X" will be sent.

As shipped, a ground applied at a trigger input will generate an alarm message. To generate an alarm when a ground is removed, open the S1 switch associated with that input. For example, when S1-1 is open ("OFF"), an alarm will occur on input one when ground is removed. If alarm generation is desired upon application (or removal) of a voltage (10 to 28 V_{dc} grounded supply), open J9 through J16 and close J1 through J8. For operation with optically isolated inputs, open J1 through J16. Apply (or remove) the 10 to 28 volt supply to (or from) the two terminals associated with each input (observe polarity). The associated S1 switch should be closed ("ON") to sense the presence of current and open ("OFF") to sense the absence of current.

For radio operation, transmit audio is obtained from TB2-9. If the transmit audio is applied to the radio microphone input, an attenuator pad should be used to limit the maximum applied audio to about –15 dBm. Radio PTT is obtained from TB2-7. Connect the receiver COR to TB2-11. The COR connection inhibits alarm reporting while the receiver is active. This allows the radio channel to be used for voice communications and/or multiple DAU-782 units without the danger of losing messages.

For 600-ohm voice-grade line operation, connect TB2-8,9 to an external terminated 600-to-600-ohm isolation transformer. Use of voice or multiple DAU-782s on a single line is not recommended without external traffic-sensing equipment because the possibility exists that an alarm message will not be decoded in the presence of voice. If alarms are received from two DAU-782s simultaneously, than neither message will be decoded. For applications utilizing voice and/or multiple alarm panels on a single line, contact the factory.

"PTT delay" for the radio transmitter is factory adjusted to 250 ms. For longer or shorter times, adjust R19.

Factory programming is for a 10-digit-per-second message rate and for the message to be sent twice. For a faster or slower rate, adjust R20. For a send-once message, open S2-5.