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SECURITRON MODEL DK-11W DATA OUTPUT DIGITAL KEYPAD INSTALLATION & OPERATING INSTRUCTIONS

1. DESCRIPTION

Securitron's DK-11W is a one piece digital keypad designed to output **Weigand 2601 format data** and therefore integrate into an access control system just as if it was a card reader. It is furnished on a single gang, stainless steel outlet box cover with two plastic backboxes respectively for flush or surface mounting. Two LED's (green and red) controlled by the system are furnished.

The DK-11W is not waterproof and is intended for **interior use**. However, an accessory cover (part # WCC) allows its use outside where direct, heavy rain is not expected.

2. PHYSICAL INSTALLATION

Note that the DK-11W is supplied with a choice of tamper resistant #6 spanner machine screws and conventional screws for attaching the plate to the backbox.

Two backboxes are supplied with the DK-11W. The blue backbox comes with a template and is used for **flush mounting** on dry wall or other material where a cut-out can be made. The beige two-piece backbox allows **surface mounting** on a variety of materials. To use the beige backbox, note that its cover and base are snapped together and must first be separated by either pulling the outer rim of the cover away from the base or inserting a screwdriver into the four holes at the corners of the cover and prying the base loose. Once the base is separated from the cover, remove the large rectangular knockout in the center of the base by cutting around it with a knife and then popping it out. The base can then be mounted with the supplied #6 sheet metal screws and plastic anchors. The DK-11W mounts on the cover with the supplied #6 machine screws and then the cover with DK-11W snaps into the mounted base. Wires are usually pulled through the center of the base although it is also possible to attach plastic wiremold raceway to the side of the cover (note the knockouts on the inside of the cover sides).

The DK-11W can be used outdoors with the optional rain cover (part #WCC) although we do not advise this use in areas exposed to heavy, direct rain. When used outdoors, you must supply a weatherproof, gasketed backbox (available from Securitron under part #WBB).

3. WIRING

3.1 POWER AND DATA WIRING

Figure one shows the rear of the DK-11W. You will make connections to the six terminals as shown in the drawing and either leave the jumper block in the factory set position (connects pins 2 and 3) if you plan to power the DK-11W with 12 VDC or move the jumper to connect pins 1 and 2 if you will be using 5 VDC. Note that **operation at 12 volts** with the jumper block in the 5 volt position **can damage the unit**.

Note that **the DK-11W will not operate on AC power**. It will, however, accept **full wave rectified DC power** (transformer + bridge rectifier) **when it is being powered by 12 VDC**. When it is being powered by **5 VDC, the voltage must be regulated** (+/- 1/2 volt). Be sure to **observe polarity** when you power the DK-11W.

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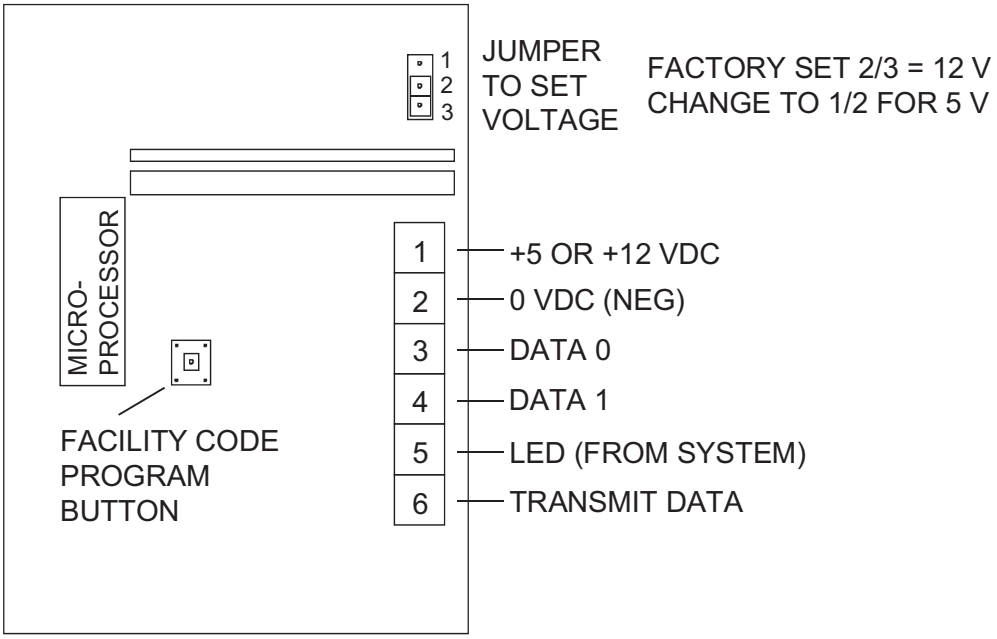
FIG. 1: CIRCUIT BOARD OVERVIEW



The DK-11W will draw a maximum of **35 mA at 5 VDC or 12 VDC**.

Note that space does not permit numbering the six terminals on the circuit board. When making your connections, you have to refer to the drawing and mentally count off the terminals.

The Weigand output terminals: Data 0 and Data 1 connect to the appropriate inputs of the access control system. The **wire run maximum distance** for reliable operation depends on the wire gauge. A guide line is 200 ft. for 22 gauge; 300 ft. for 20 gauge and 500 ft. for 18 gauge.

3.2 LED AND "TRANSMIT DATA" WIRING

The LED's on the DK-11W follow the convention for card readers. When a "high" signal (+5 VDC) is connected to the LED terminal, the red LED will be on and the green LED will be off. When this input goes "low" (0 VDC), the green LED will be on and the red LED will be off. This flipping of the LED's is controlled by the access system and typically prompts the user when his entry has been accepted (or not accepted).

The "transmit data" terminal is not used with most systems. When it is unconnected, the code sequence is automatically transmitted to the system following key entry (see Section 5). However, with some systems, the controller can be busy and must therefore remotely command data transmission. If this input is in a low state (connected to 0 VDC), the DK-11W will store the code sequence until the input goes high (receives +5 VDC). The code will then be transmitted as the system will be prepared to receive the sequence and release the door. Naturally, while a code is being stored, the keypad will ignore further inputs as the delay prior to the system commanding transmission of the code sequence will be very brief.

4. FACILITY (SITE) CODE PROGRAMMING

In the Weigand 26 bit code format (also called 2601), the first eight active bits constitute a facility or site code. These eight bits correspond to standard numbers 0-254. The access control system normally expects to see a "two part" transmission wherein the eight bit facility code precedes the 16 bit PIN code which identifies the individual who is requesting entry. Possible PIN codes convert to standard numbers 0-65,534. The reason for the creation of the facility code is to enhance card security as on a card, both the facility and PIN codes are stored. If a card was transported to a different facility, it would not be accepted by the different system even though the PIN code happened to be valid because the facility code would not be.

With a digital keypad like the DK-11W, the facility code required by the system must be internally stored since a person requesting entry will only know his PIN code. The DK-11W ships with a **factory set facility code of "0".** To **change the facility code** to the one in use by the system, identify the program button on the unit's circuit board (see Figure 1). With the unit powered, press the button until you hear a steady beep. This annunciates **facility code program mode**. If you do nothing, the unit will automatically drop out of program mode **in 30 seconds** and the facility code will not be changed. To change the code, during this 30 second window, simply enter the new facility code. You don't have to enter three digits if the facility code is less than 100 (leading zeros are not necessary). Do not pause more then five seconds between digits as the unit has an internal timer that resets five seconds after a key press. After you have completed site code entry, you can press "*" or "#" to terminate the sequence or simply wait five seconds. You will receive a **single beep to confirm a good entry**. If you have entered a sequence that is too large (a number greater than 254), you will receive a **double beep** (error). This is your prompt to re-enter the code. To do this, you will have to press the program button another time as the unit will not remain in program mode after data entry.

The DK-11W employs non-volatile EEPROM memory so that the facility code is **retained in a power failure**.

5. OPERATION

To operate the unit, simply enter the PIN code (from 0-65534) and then either press * or # or wait five seconds. Note that successful key presses are **echoed by a beep**. The PIN code together with the site code prefix stored in the unit will then be sent to the access control system. **Do not pause more than five seconds** between digits or an incomplete sequence will be transmitted as the unit automatically transmits when it does not see any key presses for five seconds. The system will respond by allowing entry or not and will generally annunciate this by control of the two LED's. How the LED's are used exactly will vary from system to system. If you enter a number larger than 65,534, the DK-11W will reject the sequence and transmit nothing. This rejection is communicated by two beeps (the error signal).

APPENDIX A: 2601 CODE STRUCTURE

The 26 bit transmission begins with a parity bit followed by 24 code bits and ended by a second parity bit. The first parity bit is even parity calculated over the first 12 code bits as follows: if the 12 bits sum to 0, the parity bit is set to 0. If the 12 bits sum to 1, the parity bit is set to 1. The second (ending) parity bit is odd parity calculated over the second 12 code bits as follows: if the second 12 bits sum to 0, the parity bit is set to 1. If the second 12 bits sum to 1, the parity bit is set to 0.

The 24 code bits have internal structure as follows. The first eight bits are the facility code. The next 16 bits are the PIN code. All data is transmitted Most Significant Bit first from the keypad. The transmission begins with the even parity bit, proceeds through the eight bit facility code followed by the 16 bit PIN code and ends with the odd parity bit.

The transmission of a 0 bit occurs when the data 0 line transitions below 1.1 V for 50 microseconds. The transmission of a 1 bit occurs when the data 1 line transitions below 1.1 V for 50 microseconds. The interval between bit transmitting pulses is one millisecond.

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