

SECURITRON MODEL DK-26W DIGITAL KEYPAD INSTALLATION & OPERATING INSTRUCTIONS

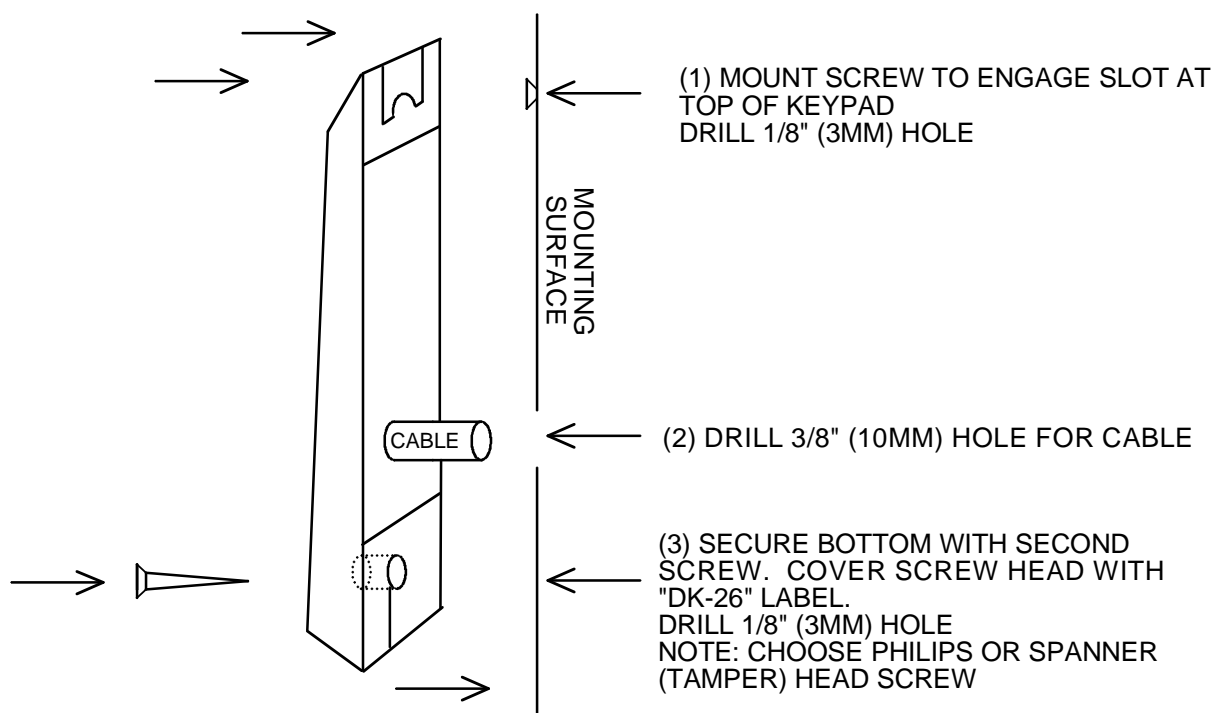
1. DESCRIPTION

Securitron's DK-26W is a two piece digital keypad system designed to output **Weigand 2601 format data** and therefore integrate into an access control system just as if it was a card reader. It consists of two components: the keypad and the CPU board connected by a 16 ft. cable. The rugged stainless steel keypad may be mounted outdoors in any environment as it is fully weatherproof. The keypad features two active LED's (green and red controlled by the system) and a beeper.

2. PHYSICAL INSTALLATION

The first step is to plan the physical location of the two components. The keypad is normally surface mounted on the outside of the door to be controlled, and the CPU Board is mounted inside the protected area safe from tampering.

FIG. 1: PHYSICAL INSTALLATION OF KEYPAD



To install the keypad, holes must be drilled for the 2 mounting screws and the cable. A template is not provided due to unavoidable variations on the cable exit of each keypad. Referring to Figure 1, note that the top screw engages the slot at the top of the keypad. Once the top screw has been installed, the location of the cable hole should be set roughly by positioning the keypad and marking the cable hole point. Make sure the keypad is pulled down firmly on to the screw. A 3/8" (10MM) hole is then drilled for the cable. After the cable has been pulled through, the final screw secures the keypad to the wall. Note that 2 alternate bottom screws are supplied with the unit. One is a #10 spanner head for improved tamper resistance. Alternately the #8 Phillips standard screw may be used. After this, peel the backing of the enclosed Securitron DK-26 label and **affix it to the bottom of the keypad covering the head of the screw**. This not only improves the appearance of the keypad but helps foil casual vandalism. Note finally that a **blank rectangular label** has also been furnished. This can be used to cover up the "BELL" legend if desired.

The CPU Board is furnished in a snap-apart steel enclosure with the board itself mounted on plastic snap-trak. The CPU Board must be installed in a dry location free of extremes of temperature and humidity. If the 16 ft., twelve conductor cable that is included is not of sufficient length, additional cabling can be spliced by the installer. However, a long cable run can give

rise to electronic noise problems in certain environments. It should therefore be avoided where possible and in no case should cable length exceed **30 ft. (10 meters)**.

Cable entry to the CPU board enclosure can be handled in one of two ways. There is a hole in the bottom of the enclosure, the use of which creates the most attractive installation as the cable is completely hidden. Alternately, there is a side knockout in the enclosure cover which permits surface mounting of the cable. **The side knockout also permits a wiring technique which is convenient when the CPU board enclosure is to be mounted in an awkward location such as above a drop ceiling.** You can pop the board itself out of its snap track and make all your connections with the board in your hands. The board is then re-snapped into the plastic trak. The enclosure cover snaps on with the wires emerging from the side knockout. If you use this technique, **avoid touching the components or rear pins on the board as much as possible.** Static electricity can destroy the processor. Also when you **snap the board back** in its track, make sure it's securely done. Sometimes you need to squeeze the outer lips of the track to insure that the board edges are really seated in the slot.

3. WIRING

3.1 POWER, DATA AND KEYPAD WIRING

Figure 2 shows the DK-26W CPU Board. You will make connections to the 18 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-26W 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.**

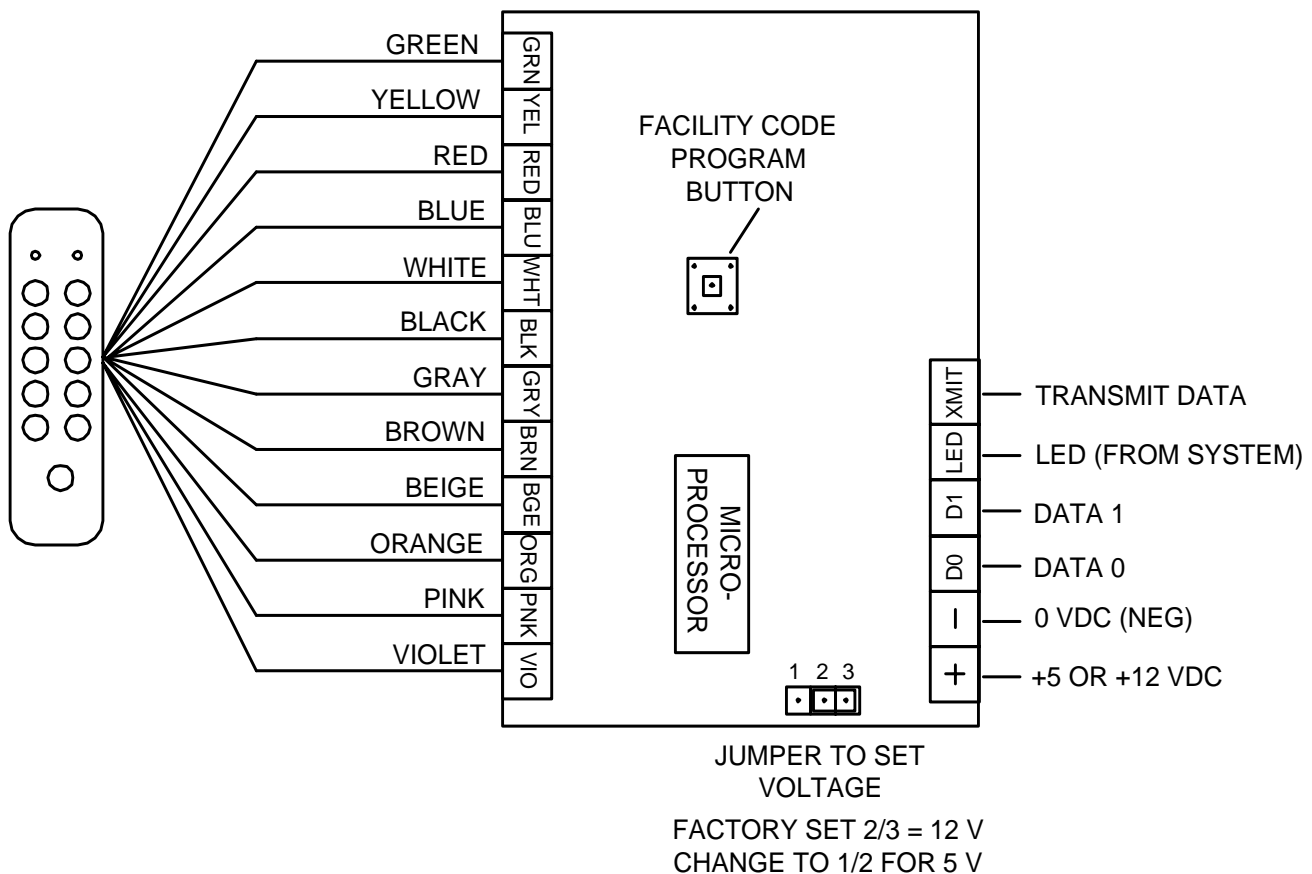
Note that **the DK-26W will not operate on AC power.** It will, however, accept **full wave rectified DC power** (transformer + bridge rectifier) **when it is being powered by 12 VDC.** When it is being powered by **5 VDC, the voltage must be regulated** (+/- 1/2 volt). Be sure to **observe polarity** when you power the DK-26W.

There are 12 color coded wires in the keypad cable. Refer to Figure 2 and connect each wire to the indicated terminal on the CPU Board. No other connections may be made to these terminals (except if two keypads are used with one CPU board).

The DK-26W will draw a maximum of **30 mA at 5 VDC or 12 VDC.**

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.

FIG. 2: OVERVIEW OF CPU BOARD



3.2 LED AND “TRANSMIT DATA” WIRING

The LED's on the DK-26W 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-26W 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-26W, the facility code required by the system must be internally stored since a person requesting entry will only know his PIN code. The DK-26W 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 CPU board (see Figure 2). 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 than 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 “BELL” 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-26W 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 BELL 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-26W will reject the sequence and transmit nothing. This rejection is communicated by two beeps (the error signal).

5.1 DUAL PAD OPERATION

If keypad control from both sides of the door is desired, **two keypads can be connected to one CPU Board**. Simply put the colored wires from both keypads into the appropriate terminals on the CPU Board such that two wires are in each terminal. Either keypad will then be able to transmit a code and both keypads will beep and illuminate their LED's when either one is used. Two is the maximum number of keypads that can be connected to one CPU Board. Note that in the unusual case where both keypads are being used simultaneously, the code will not be properly sent as the sequence will certainly be disturbed. Only one keypad may be used at a time. **Be sure you don't violate egress building codes when employing a keypad on the inside of a door. Check with your local building or fire department.**

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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