

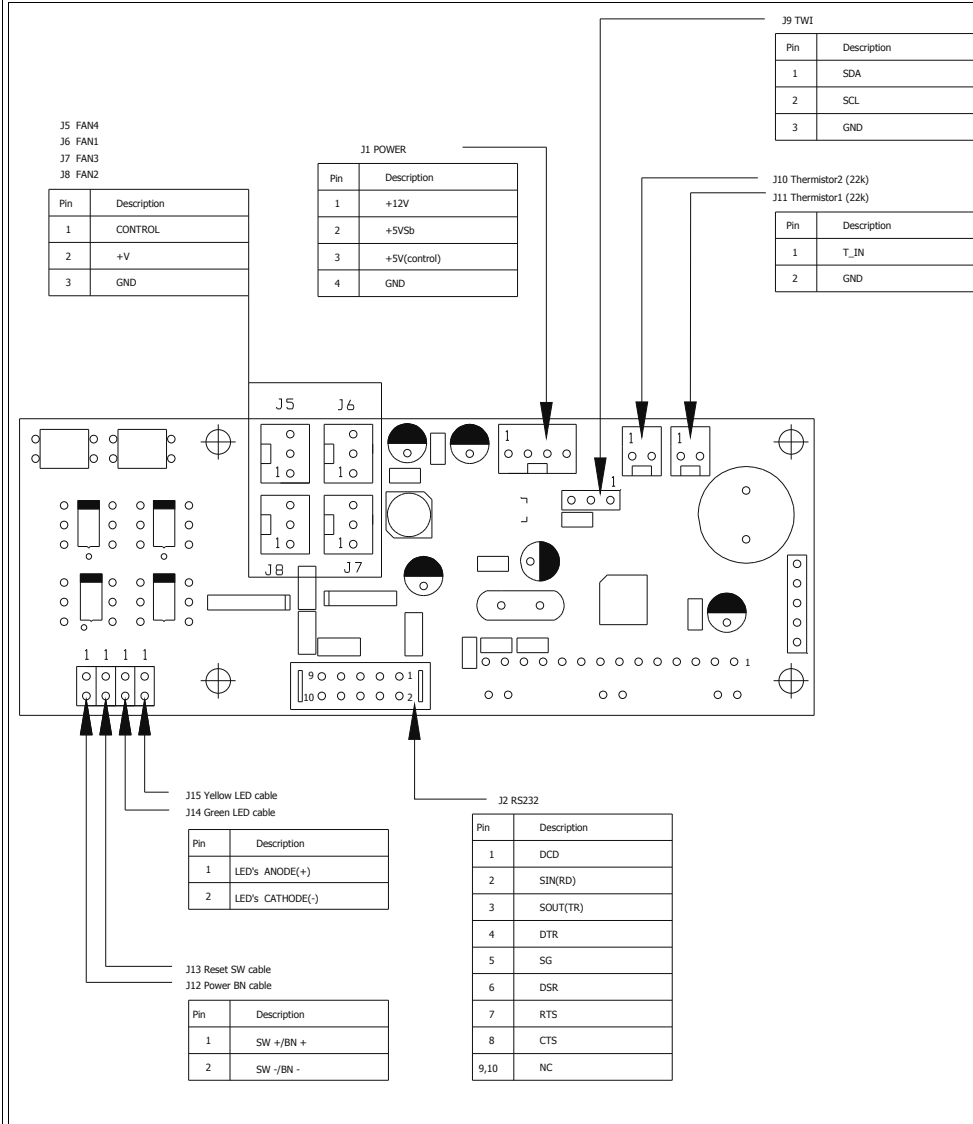
ADVANCE INFORMATION
ALL INFORMATION IN THIS USER MANUAL IS PRELIMINARY AND SUBJECT TO CHANGE.

TeleServ – Fan controller and LCD/4xButton/RS232 Terminal

(R 1.3 February 2006)
2004 by DV "Industrial Computer"®
BRIEF MANUAL

Introduction

This device should be attached and tuned by specialized personnel only after familiarizing themselves with current manual!



increases reliability of hardware functioning due to the total monitoring of cooling system and signalling in case of failures. The use of controller combined with the system with redundant cooling facilities allows to create fault-tolerant system with long-life performance. The controller also emulates power on/off button and «reset» button for computer. These buttons are protected by PIN-code to prevent a unauthorized access to computer control.

Input from the RS-232 (serial line) is parsed, decoded and either executed if it is command sequence or displayed on the LCD if it is data (in «terminal» mode only).

To get detailed information about features of controller and information how to connect and program refer to the Detailed Manual.

Figure below shows pinouts and profiles for the controller connectors. Current brief manual gives information on j5-J9 and J12, J13 connectors only. J5, J6, J7 and J8 connectors are used to connect 3-wire 12VDC fans (3-th pin is frequency tacho-generator). Connector J9 is reserved for next revisions of firmware. In the firmware of revision 1.3 connector J9 is used for switch ing the controller into EEPROM defaults loading mode only. J12 and J13 should be connected to the «Front Panel» connector of computer motherboard. Usually the «Front Panel» connector is connected to buttons «Power» and «Reset» that are placed on the front panel of computer. Pressing these buttons will either switch the control computer on/off or reset. I.e. the controller operates like «Front Panel» buttons with one difference – polarity should be kept. The controller can be connected to the motherboard either in parallel with «Front Panel» buttons «Power» and «Reset» or alone (instead of «Front Panel» buttons). To get detailed information about all connectors and information how to make connection refer to the Detailed Manual.

Operation modes

The controller operates in three main operation modes:

- «Standby» mode. Power +5V and +12V are not supplied; there is banner string at the first line of LCD (scrolls along line); there is static caption: «STANDBY MODE» at the second line of LCD.
- «Monitor» mode. Power supplying and cooling systems monitoring data is displayed on LCD. Data displaying is realized by the controller firmware without external computer control via serial line.
- «Terminal» mode. Input data from serial line (computer) is displayed on LCD.

«Standby» mode

In the «Standby» mode the controller just waits for simultaneous pressing of two buttons {«Down» + «Left»} followed by «virtual hot button» menu pop up and +5V power arising. The arising of +5V power means leaving of «Standby» mode. The controller realizes neither fans control nor some information output on LCD except advertised scroll banner string output. Two buttons {«Down» + «Left»} should be pressed simultaneously to pop up the power control virtual hot button menu and then to leave «Standby» mode and to run computer. PIN-code input prompt appears and is being displayed on LCD:

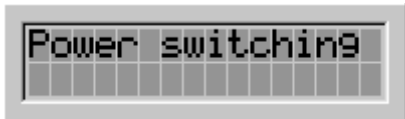


This manual is intended for firmware release 1.2. The firmware release number is written on the label stick on the CPU inside the device and this number is displayed on the LCD at the end of banner string when device is in standby mode. Also firmware release number can be obtained by a proper command sent through the serial line.

Overview

TeleServ – Fan controller and LCD/4xButton/RS232 Terminal (further – controller) – is a hardware-software device that realize an RS232-terminal that allows to communicate via COM-port with computer. There are 4 buttons and 16x2 LCD (16 chars, 2 lines) to communicate with user software and to have dialog with the user in the controller. As well the controller includes a WatchDog to supervise the computer; controller provides temperature monitoring, voltages monitoring and fans revolution control. The controller uses pre-charted matrix to make slide control of fans. Fans revolution varies depending on measured temperature of airflow according to matrix response (without external control). The controller could be off-line i.e. stand-alone regulating device that controls of cooling system. The controller assures early diagnostic of fans failures, prolongs fans service life period, diminishes power consumption and fan-made noise and

«Up» and «Down» buttons should be used in turn to enter PIN-code in all four positions (numeric characters/digits). Buttons «Right» and «Left» move cursor position to the next or previous character. The PIN-code is entered when cursor is located in the fifth position («?» character) and button «Right» is pressed. The controller verifies the code that has been entered and closes SW+/BN and SW-/BN pins of J12 connector for a 0.1s time if input code matches up. The keystroke of button «Right» extends this time until the button is released. While pins of J12 are being closed, the LCD displays the following:



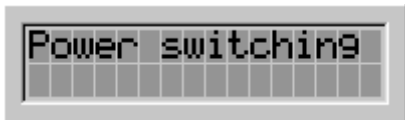
If the voltage does not arise on +5V power rail when virtual hot button is being "pressed", the controller stays in «Standby» mode.

«Monitor» mode

The controller switches to this mode immediately after arising of voltage on +5V power rail. The controller switches to «Monitor» mode both in case when +5V power rail voltage arises from "pressing" of virtual hot button or without such "pressing". The controller is in «Monitor» mode only if the voltage on +5V power rail is 4V or above. If the voltage on +5V power rail drops below 4V, the controller switches to «Standby» mode. Two buttons {"Down" + "Left"} should be pressed simultaneously to pop up the power control virtual hot button menu and then to shutdown computer and to switch controller from «Monitor» mode to «Standby». PIN-code input prompt appears and is being displayed on LCD:



"Up" and "Down" buttons should be used in turn to enter PIN-code in all four positions (numeric characters/digits). Buttons "Right" and "Left" move cursor position to the next or previous character. The PIN-code is entered when cursor is located in the fifth position ("?" character) and button "Right" is pressed. The controller verifies the code that has been entered and closes SW+/BN and SW-/BN pins of J12 connector for a 0.1s time if input code matches up. The keystroke of button "Right" extends this time until the button is released. While pins of J12 are being closed, the LCD displays the following:



The shut down of control computer could be obtain by long keystroke of button "Right" if motherboard power control logic is "locked up".

«Terminal» mode

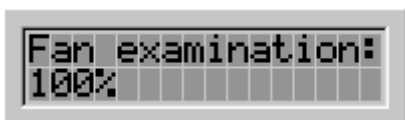
To get information about "Terminal" mode refer to the Detailed Manual.

Connected fans examination procedure

This procedure could be invoked if the controller is in «Monitor» mode only, i.e. voltages on both +5V and +12V power rails arise. The invocation of procedure is ignored in «Standby» mode. The procedure can be invoked by two ways - by sending of corresponding command from computer via serial line, or by pressing of corresponding buttons on controller. Behaviour of procedure does not depend upon the way of activating. Two buttons {"Down" + "Right"} should be pressed simultaneously to pop up the call menu of virtual hot button for fans examination and then to invoke the procedure. PIN-code input prompt appears and is being displayed on LCD:



"Up" and "Down" buttons should be used in turn to enter PIN-code in all four positions (numeric characters/digits). Buttons "Right" and "Left" move cursor position to the next or previous character. The PIN-code is entered when cursor is located in the fifth position ("?" character) and button "Right" is pressed. The controller verifies the code that has been entered. If input code matches up, then controller invokes the fans examination procedure. At that time, every 3sec. the controller varies PWM value from 100% to 40% with 5% step and varies testing voltage from max to min values. Since the procedure starts with 100% value of PWM, the LCD displays the following:



Then, the rest of 12 values of PWM from 95% to 40% appear. Outcome of procedure is the update of fan threshold revolution matrix for really connected fans. Procedure lasts for about 1 minute. At that time the controller traces over the fan voltage and fan behaviour. The controller determines the number of connected fans and their nominal revolution values for all values of PWM and for all corresponding fans voltages. If bugs (errors) occurs or if abnormal behaviour of fans is detected, then the default values are being loaded to the fan threshold revolution matrix (factory pre-charted values).

«Reset» virtual button

Simultaneous pressing of two buttons {"Up" + "Right"} in «Monitor» and «Terminal» modes allows to pop up the "reset" virtual hot button menu. PIN-code input prompt appears and is being displayed on LCD:



"Up" and "Down" buttons should be used in turn to enter PIN-code in all four positions (numeric characters/digits). Buttons "Right" and "Left" move cursor position to the next or previous character. The PIN-code is entered when cursor is located in the fifth position ("?" character) and button "Right" is pressed. The controller verifies the code that has been entered and closes SW+/BN and SW-/BN pins of J13 connector for a 0.1s time if input code matches up. The keystroke of button "Right" extends this time until the button is released. While pins of J13 are being closed, the LCD displays the following:



The durable reset of control computer could be obtain by long keystroke of button "Right".

PIN-code change

PIN-code 7268 has been written during controller producing. PIN-code is stored in EEPROM, therefore it could be easily changed. Simultaneous pressing of two buttons {"Up" + "Left"} in all modes allows to pop up the PIN-code change menu. PIN-code input prompt appears and is being displayed on LCD:



Then, new PIN-code should be entered:



Then, new PIN-code should be entered again:



If second enter of PIN-code does not match to the first one, the new PIN-code is not activated and the old PIN-code stays valid. New PIN-code should be kept in mind strong. If the PIN-code is lost, the default PIN-code (7268) could be activated with EEPROM set defaults.

EEPROM set defaults

To perform this procedure jumper on J9 should be closed by shorting 1-2 pin. ATTENTION! All volatges that supply the controller should be dump. To realize this, unplug high voltage power cord from power supply unit and dump standby voltage 5V (+5Vsb). After 5-10sec pause jumper should be closed and standby voltage 5V should be applied (high voltage power cord should be plugged to the power supply unit). The LCD displays the following:



Appearance of this title means that PWM values matrix for temperature intervals and fan threshold revolution matrix have been pre-charted by default values. And more, PIN-code 7268 has been assigned for the controller.