

SELENA

TEMPERATURE MONITORING AND CONTROL (Option # 711, # 712 and # 713)

Rev. 32

In all temperature monitoring or control configurations the function **Fn 61** must be enabled.

The functions **Fn 0** and **Fn 1**, when enabled, will cause the display to show the temperature sensed by one or two probes. Up to 2 temperature probes may be connected to the clock terminals (optional).

For the ease of understanding, the probes are designated as **Internal** and **External**, even though they may be both wired externally.

The clock is capable of monitoring and controlling (optional) the temperature sensed by the external and/or internal probe (use function **Fn 27** to select the controlling probe) . The wired sensor probe(s) can be located at a significant distance away, up to 500 feet (150 meters), or optionally, one probe may be installed on the side of the clock enclosure.

The system also stores the historical **Minimum and Maximum Temperature** readings that can be displayed *ON DEMAND* via the remote control (by pressing the UP or DN key).

In addition, by presetting the LOW and HIGH TEMPERATURE ALARMS, the user may activate the control operation of the **Internal Control Relay (if installed) and / or the Internal Alarm Buzzer** to indicate the ALARM status (see **Fn 29**).

The temperature may be displayed in Fahrenheit units (**Fn 15** disabled) or in Celsius units (**Fn 15** enabled).

The temperature display resolution is normally 1F (or 1C), but in the displays with at least 6 digits it is possible to increase the resolution to 0.1F (or 0.1C). This feature is controlled by the function **Fn 19**.

TEMPERATURE PROBE type selection

The system can operate with two different types of NTC temperature probes specified as 50 Kohm or 100 Kohm , depending upon the setting of the function **Fn 93**. Enable this function only if 100 Kohm probes are installed.

Note, that the higher resistance probe responds better to higher temperatures, while the lower resistance probe is better for sensing of lower temperatures.

Temperature Test Specifications:

Temperature Test Range:	-40F (-40C) to +255F (+124C)
Standard Resolution (Fn19 disabled):	1F or 1C
High Resolution (Fn19 enabled):	0.1F or 0.1C
Accuracy:	+/- 1%

NOTE, that the function **Fn 71** may be used to cause the system to NOT AVERAGE the temperature readings. This will result in faster reaction to the temperature changes, but at the same time, the readings may become less stable.

Temperature Probe Specifications:

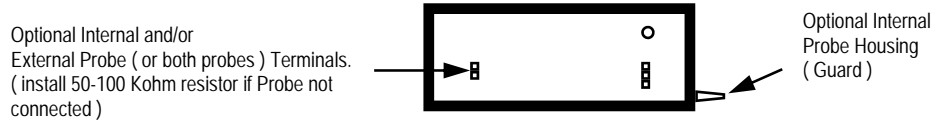
Model:	NA7050KB3950BRS
Res. @ 25C:	50 Kohm
Oper. range:	-40F (-40C) to +257F (+125C)
Accuracy:	+/- 1%
Dimensions:	1" lg x 0.25" dia (25mm lg x 6.3mm dia)
Housing:	Brass
Wiring:	24AWG, Teflon jacket

Model:	NA7100KB4100BLK
Res. @ 25C:	100 Kohm
Oper. range:	-40F (-40C) to +302F (+150C)
Accuracy:	+/- 1%
Dimensions:	1" lg x 0.2" dia (25mm lg x 5mm dia)
Housing:	Aluminium, black coated
Wiring:	24AWG, Teflon jacket

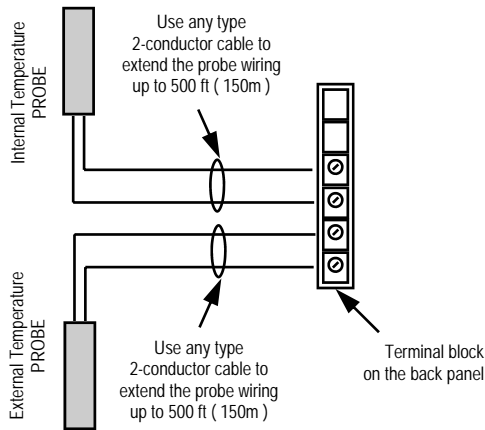
TEMPERATURE PROBE Installation

Make sure that all power is disconnected.

1. Locate the External Probe screw terminals on the back panel of the enclosure.



2. Attach one end of the Probe's extension cable (2-conductor) to the sensor terminals and the other end to the temperature probe. The extension cable may be up to several hundred feet (meters) long.
NOTE: The Probe extension cable should be of low gauge to prevent the heat/cold accumulation by the large metal mass of the wire, which may cause unwanted changes of the probe temperature.



NOTE: When the "internal probe" is installed in the display housing, care should be taken to avoid unwanted transfer of the clock's or other equipment heat/cold to the probe body, in order to prevent incorrect readings.

Temperature Display activation

To assure that the EXTERNAL Temperature is displayed **ALL the time**, enable the function **Fn 1** and **disable** all other display functions (Fn 0 and Fn 2 to Fn 7).

To select the INTERNAL probe, enable Fn 0 instead of Fn 1.

If the INTERNAL probe is to be selected as the control probe, enable Fn 27 .

1. Invoke the Function Programming mode by pressing the **FUN** key after the remote programming mode has been activated (by pressing the **MUTE** key 5 times within 3 seconds or by removing the supply power for 2 seconds and restoring it).
2. Using the **UP** and **DN** keys, select the function number that is to be enabled or disabled.
3. Press the **NXT** key to toggle the dot in the lower, right corner of the display. When the dot is ON, the selected function is enabled. Set the functions as required for the application.
4. If necessary, using the **UP** and **DN** keys, select another function number that is to be enabled or disabled and follow the step 3.
5. When finished, wait several seconds until the display goes back to the regular operating mode.

Temperature Control and Alarm activation

The Temperature Alarm function is active when the function **Fn 29** is enabled. If the Alarm is to control an external load, the Internal Relay, option # 727, must also be installed.

The Temperature Control function is active when the function **Fn 30** is enabled and the Internal Relay is installed. For this function to operate the option # 713 must be installed.

To enable / disable the necessary functions, follow the steps as listed in the previous section.

Control and Alarm Temperature programming

1. Invoke the Data Programming mode by pressing the **NXT** key after the remote programming mode has been activated (by pressing the **MUTE** key 5 times within 3 seconds or by removing the supply power for 2 seconds and restoring it).
2. Press the **FUN** key until the display shows the present temperature reading with the flashing “**C**” or “**F**” character. If necessary, toggle between CELSIUS or FAHRENHEIT unit by pressing the **UP** or **DN** key.
3. Press the **NXT** key until the display shows the text “**LoAL**” and then set the desired LOW TEMPERATURE ALARM using the **UP** and **DN** keys.
4. Press the **NXT** key until the display shows the text “**HiAL**” and then set the desired HIGH TEMPERATURE ALARM using the **UP** and **DN** keys.
5. Wait for several seconds without pressing any keys. The clock will resume regular operation.

NOTE: In order to deactivate either the Low Alarm or the High Alarm, set that alarm value to the lowest (-40F) or the highest (+255F) temperature.

NOTE: If the temperature options are not installed, random readings may show.

NOTE: Whenever the display shows the text: “**Prob**”, one or both of the temperature probes is malfunctioning or its wiring became faulty.

MIN / MAX TEMPERATURE MEMORY

This function may be activated by enabling the function **Fn 20**.
The External (or Internal) temperature historical Maximum and Minimum readings are saved in the internal memory and may be recalled for display via the remote control at any time.

To read the **MAXIMUM recorded Temperature** press the **UP** key.

To read the **MINIMUM recorded Temperature** press the **DN** key.

The memory contents will be displayed for appx. 4 seconds.

To RESET either the Minimum or the Maximum temp. Memory contents, press the **CLR** key **while** either the Minimum or the Maximum temperature is on the display. The respective memory will be reset to the **current reading**.

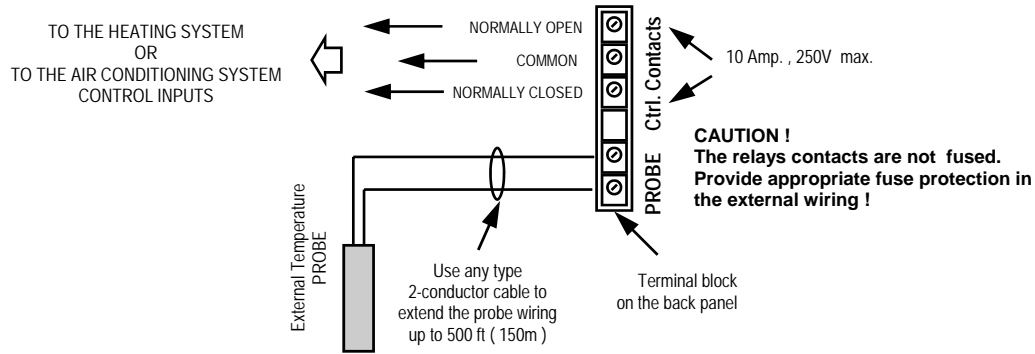
CONTROL RELAY Operation in LOW/HIGH TEMPERATURE ALARM application (option 727)

The Internal Relay can be controlled by the Low/High Temperature Alarm **ONLY** when the function **Fn 37 is NOT ENABLED**. The Internal Relay operates in several different modes depending upon the setting of the **functions Fn 18 and Fn 16**.

1. When **Fn 18 is enabled**, the Internal Relay will be switched **OFF when the Temperature ALARM occurs and ON when there is NO ALARM condition**.
2. When **Fn 18 is NOT ENABLED**, the Internal Relay will **ONLY** be switched **OFF in response to the HIGH Temperature ALARM and ON when the Temperature is lower than the HIGH ALARM preset**, even if it is lower than the LOW ALARM preset.

When the **RELAY LATCHING** is enabled (by enabling the function **Fn 16**), once energized, it will remain **ON** even if the temperature falls back within the NO-ALARM range. The relay may be reset manually by pressing the **CLR** key twice while the temperature is **NOT in the Alarm** range.

NOTE, that the internal relay installed is usually **SPDT type** and therefore both the **Normally Open** and the **Normally Closed** contacts are available at the terminal block.



Wiring for **ONLY Heating (or ONLY Air-Conditioning)** system with one Internal SPDT Relay and with one external probe.

VISUAL INDICATIONS

To change the display unit between Celsius and Fahrenheit, **enable (Celsius) or disable (Fahrenheit)** the function **Fn 15**.

- A) The Display will show the **INTERNAL probe** temperature if the function **Fn 0** is enabled.
- B) The Display will show the **EXTERNAL probe** temperature if the function **Fn 1** is enabled.

When both Fn 0 and Fn 1 are enabled, the digital display section will also show a short text designating which temperature probe test is about to be displayed. This text contents may be selected using the functions **Fn 94 and 95** as follows.

Fn 94	Fn 95	Displayed text
OFF	OFF	"In" and "Out"
ON	OFF	"Air" and "h2o"
OFF	ON	"Air" and "Pool"
ON	ON	"Pool" and "Out"

Note, that both probes may be connected to the external terminal block and may be wired up to 500 feet (150 m) away from the display, using any kind of a 2-conductor cable. Optionally, a model may be ordered with one probe installed in the wall of the display enclosure.

Note, that either one or both temperatures may be enabled to be displayed in sequence alone or also with other display modes enabled by any of the functions from Fn 2 to Fn 7.

When the temperature is set to alternate with any other display, it is possible to change the duration of displaying of each of the screens. This persistence is controlled by enabling or disabling the functions **Fn 40 and Fn 41** as required.

In clocks with the **Electronic TEXT display**, the **temperature** may be also displayed in that section and it may be made to alternate between several different screens as well (**see Fn 75, 76, 77, 85**).

Fn 75	OUT	25 C (or 77 F) (also see Fn 0 , Fn 1 and Fn 15)
Fn 76	IN	25 C (or 77 F) (also see Fn 0, Fn 1 and Fn 15)
Fn 77	TEMP	25 C (or 77 F) (also see Fn 0, Fn 1 and Fn 15, 27)

Selecting INTERNAL or EXTERNAL probe

Either the **INTERNAL** or the **EXTERNAL** temperature **PROBE** may be selected for control by enabling (INTERNAL selected) or disabling (EXTERNAL selected) of the function **Fn 27**.

If one or both probes are not used, the probes must still be connected to the back panel screw terminals. Alternately, a 50 kohm to 100 kohm resistor may be connected instead.

CAUTION: Avoid exposing the temperature probes to the direct sunlight as this will dramatically affect the readings.

To PROTECT the clock / display AGAINST ANAUTHORIZED ACCESS :

By ENABLING the function **Fn 63** (see the FUNCTION SETUP Procedure section in the Manual) all access to the clock functions via the remote control will be LOCKED-OUT. All other operation will however remain unaffected.

In order to regain the control via the Remote Controller, disconnect the supply power for 2 seconds and then restore the power and within 30 seconds Disable the function Fn 63.
All remote access to the clock will be unlocked.