MultiCon = Meter + Controller + Recorder + HMI in one package, part II

In the previous article we presented a concept and features of the MultiCon series devices and the outline of their possibilities obtained as a result of well developed software and a modular design. This part will describe other advantages, including simple operation and configuration using a TFT with a touch screen, a thing well know from such devices as smartphones or tablets.

Easy change of data presentation and displayed channels is a feature which might be useful in many cases. MultiCon offers numerous possibilities in this area – the basic function is bringing up the contextual menu by touching the display briefly. Then, a set of buttons appears on the bottom of the screen to switch between the display modes, channel groups or to enter the menu (Fig. 1).

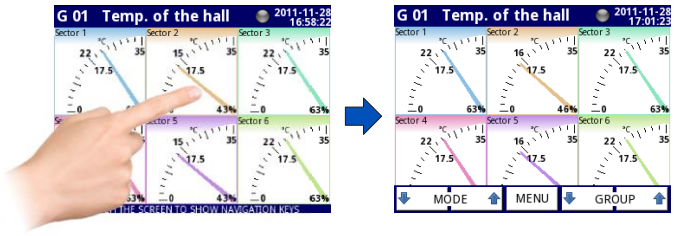


Fig. 1: Contextual menu

The “MODE” buttons allow a quick selection of data presentation method on the screen. Depending on whether we need a detailed information on the signal value, quick insight into the signal level, or parameter trend over time, the data can be presented as:

- numerical values - Fig. 2a
- needle dials - Fig. 2b
- horizontal or vertical charts - Fig. 2c
- horizontal or vertical bars - Fig. 2d
- simultaneous presentation many groups - Fig. 4

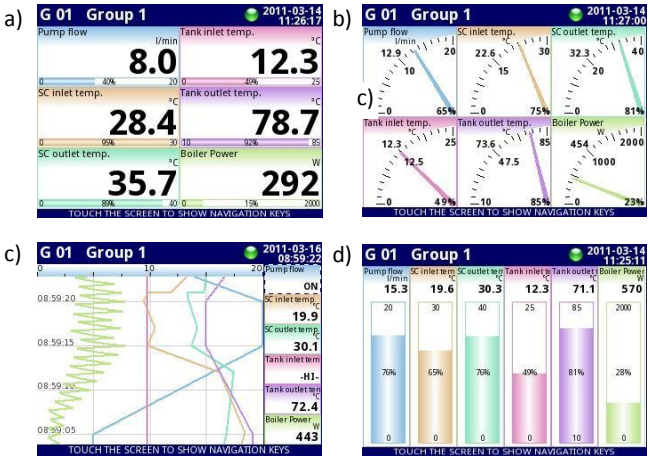


Fig. 2: Basic data presentation modes on the screen

In the first four modes, the panels present in a clear manner the name and the unit of measure which are specified and entered by the user, its graphical or numerical representation, and in addition a percent value in relation to a set level. The last mode allows to present as numbers up to 30 channels on one screen. This mode is particularly comfortable in MultiCon-141 equipped with a large 5.7” display.

The time graph data presentation mode is useful for recording operation. Depending on the configuration, the graph background can be black (Fig. 3a) or white (Fig. 3b, 3c), and the graph itself can be set as horizontal (horizontal time axis – Fig. 3c) or vertical to maintain conformity with traditional paper recorders (Fig. 3a, 3b). The user can also set the line thickness.

Fig. 3: Data presented as a graph

For the sake of clarity of results, the measurement channels are assigned to groups. The “GROUP” buttons are used to select the group which will be displayed. Figure 4 presents a mimic board view with 30 channels from groups from 1 to 5. Using the “GROUP” buttons will change the range of displayed channels; this also applies to all other data display modes.

Fig. 4: Simultaneous presentation, groups 1 to 5

MultiCon CMC-99 has 10 groups, and MultiCon CMC-141 has 15. A single group can contain maximum 6 channels, but the channel assignment to groups is not restricted, and the same channel can be displayed in many groups, providing the user with full flexibility to group various indications (e.g. one room, the same equipment, groups of measurements of the same type, etc.). For example, Fig. 5d shows a group related to one physical equipment. Selecting the number of channels assigned to a group, we can obtain different sizes of various indicators (Fig. 5).

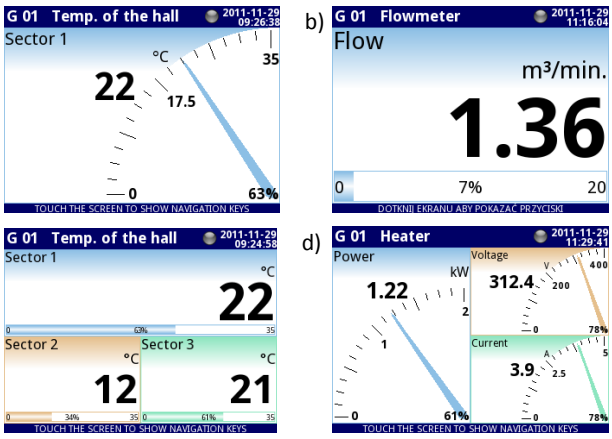


Fig. 5: Presentation of individual data groups

At this point, it is worth emphasizing the mathematical capacity of MultiCon devices. In Fig. 5d, the channel "Power" is calculated from the "Voltage" and "Current" channels by setting the multiplication function - but this feature will be dealt with in more detail in part III.

The MultiCon series devices equipped with the ACM (Advanced Communication Module) allow also a very easy remote monitoring of measurement results using a web browser, as well as a very attractive graphical presentation in the form of built-in or user-created websites. Along with the device, the manufacturer supples a set of built-in Java applets which using the Modbus TCP protocol provide the programmers with easy mechanisms to retrieve data from the device, as well as ready-to-use formats of data presentation on the computer screen. An example of such a website is shown in Fig. 6. As you can see, its appearance and structure depend only on the programmer's ingenuity.

In order to facilitate the use of their own websites by the users who do not know HTML, Simex has prepared a few examples which are distributed with the free DAQ Manager software used to manage the data recorded by MultiCon.

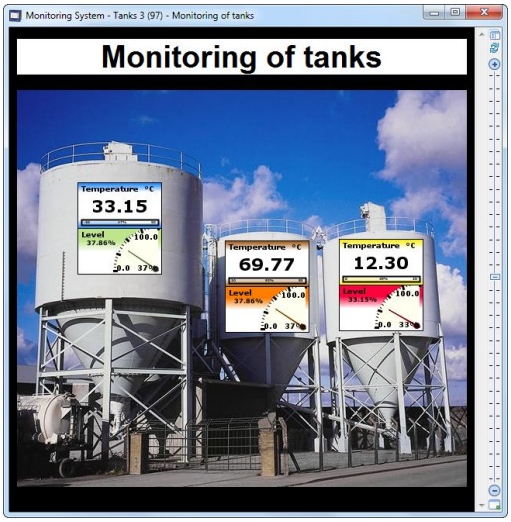
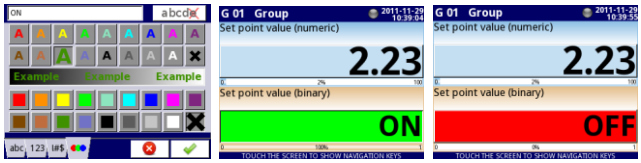


Fig. 6: Example of a website created using the Java applets

Press the "Menu" button to enter the main menu of the device (Fig. 1). If the menu is password-protected, a window will appear with a request to enter the password. Access to menu gives a user extensive freedom to configure the MultiCon, and without knowing any programming language! Here are some potions available from the menu level: results presentation mode, panel appearance, measurement ranges and indication ranges, assignment of channels to groups, language (including Polish, English, German, Russian, French, Spanish, Romanian, Czech), channel operation modes, disk operations, device data, configuration of communication interfaces. Let us focus on the presentation of results.

MultiCon allows a very precise configuration of the data display method, in particular it allows to specify the names and units shown in individual channels, rescale the measurement data and set ranges in the indicator and graph modes. A particular case – binary data can be presented not only as 0/1. Any text can be assigned to the logical states. For example (Fig. 7a), the "ON" string on the green background is assigned to the "0" state, and in the "1" state the display will show "OFF" on the red background. Setting a string of spaces instead of the text, we get an imitation of a control light which lights up in any colour the programmer selects for a given state.



a) b) c)

Fig. 7. Configuration of binary data presentation: "Setpoint" mode

It is absolutely necessary to mention one more data display mode - "Setpoint" - although it is more related to the channel operation mode than presentation of results. Touching the screen in the field of such configured channel, the user can in no time at all change a fixed value assigned to the channel (e.g. a threshold in the controller). In addition, this mode can be mixed with binary data presentation as described above (Fig. 7b, 7c) which allows an easy definition of function keys on the screen. The other interesting feature of the "Setpoint" mode is access to the settings. Depending on the needs, the admin can configure a channel so that the changes are made only by authorized users or any operator, also the one who does not know the password.

As a piece of interesting information, let us here present a "trick" - a quick access to group settings or settings of channels in a group. Instead of entering the menu and selecting the channel from the list, you can just touch and hold the screen in the area of the channel that interests you and you immediately enter the editing of this channel's parameters (Fig. 8). Operation of the group is similar: press and hold the top bar on the group name and you enter a relevant submenu.

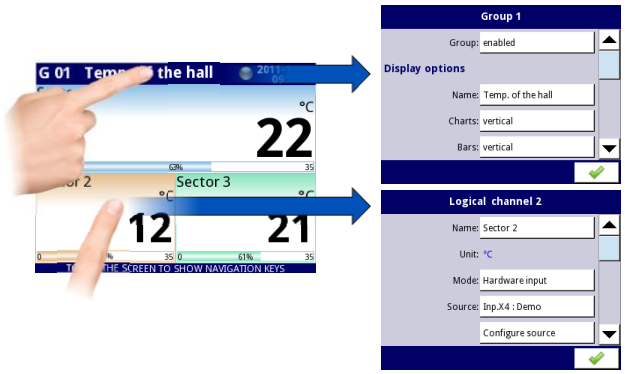


Fig. 8: Editing the group and channel

The next article will be dedicated to the firmware potential in terms of controller applications (including multiple PID controllers), mathematical capacity and operation in various communication networks.

Measure, Control and Log data

SIMEX Ltd.
Wielopole 7, 80-556 Gdańsk
tel: (+48) 58 76-20-777, fax (+48) 58 76-20-770
www.simex.pl, e-mail: info@simex.pl