



FROM THE FIRST DRAFT  
TO THE SERIES  
EVERYTHING OUT  
OF ONE HAND

## ADKOMunity III, April 2019



Topic of our February NL was the temperature behavior of a LCD at minus degrees. Now, according to our notice, this issue bargains for problem solving and successful operation.

Closely associated to LCD operation at minus temperature, today, we present special heating foils and ITO layers as LCD heater, 'though nobody is currently thinking of frost at spring like weather. However, the next winter is certain to come.

The next issues of ADKOMunity are going to contain more fascinating product introduction. Focal points will be a 10,1" TFT with integrated converter board MIPI – LVDS on the one hand and the intro of an extreme wide format E-paper with 55\*295mm, e. g for labeling, on the other hand.

In part III we would like to continue introducing another team member, that is to say Mrs. Marion Frey.

### ADKOM™ Elektronik GmbH

Postfach 1133 | Oberhäuser Str. 12 | D-73098 Rechberghausen | Germany

Tel. +49 (0)7161 9589-0 | Fax +49 (0)7161 9589-99

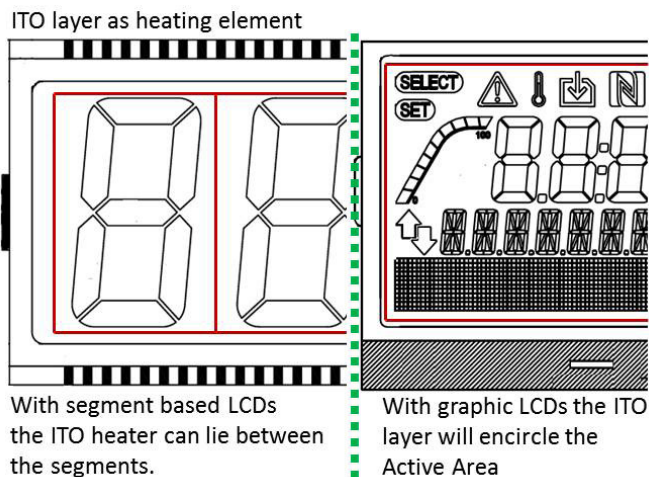
info@adkom.de | ADKOM.DE

## Securing LCD functionality at minus degrees

In our latest issue we showed the changeover “delay” of an ASTN LCD by the means of a case study. The necessary time for a change of content at 0°C – –30°C in relation to temperature was pointed out. For some applications it is formally required to assure functionality at –40°C. As switching times do not go unnoticed there is only the option of an additional heating foil integrated in the LCM, for existing applications. For customer-specific new developments of LCDs, there is also the alternative of integrating a heating level directly into the display by means of the ITO layer.



Heating foils can be manufactured exactly to the dimensions of the LCD or a LCM and usually have a thickness of a few tenths of a millimeter. The heating foil is then placed as an intermediate layer between PCB and display, or the backlight. To operate the heating foil, it is essential to provide an additional required controller IC specifically for this purpose, which controls nothing but the switching cycles of the temperature sensors. A point that, of course, has to be taken into account in terms of additional power consumption in handheld and battery operation.



In the customer-specific development of LCDs and LCMs, separate ITO layers that take on a heating function can be provided on the lower glass of the display as an alternative to the heating foil. These layers are also driven by an independent controller and also require a separate contact to the PCB.

This form of heating allows segment-based LCDs to guide the heating layer around individual segments. For graphic LCDs, a frame is placed around the Active Area, which performs this task. Selfsame applies to either types of dew formation, respectively the protection against moisture in the device.

**If you have any questions about this topic, please do not hesitate to contact our sales team.**

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## Marion Frey, Assistant to the management & ADKOM QM Representative

As assistant to the management, she is responsible amongst other things for contracting, but also for the quality management of the company: “I am something like the paper tiger of the ADKOM”, she laughs. And fully relies on the products from our company: „I do not really know how a slide rule works, but displays are of course my world! And even if a large part of the products come from the Far East today, I’m sure: „There will be no way around German thoroughness in the future.“

Therefore, she looks without any hesitation on what is currently happening in terms of Industry 4.0. The ever faster world and its products do not scare her: „We cannot change it. Hence: Accept and see what actually prevails.” After all, digitization brings many improvements – but sometimes I have the feeling that I cannot keep up anymore when my son shows me something on his mobile phone. But that certainly applied to our parents under other aspects.”

In her free time, the family determines the life of Marion Frey: “Our children are our one and only”, she agrees with her husband and – in business – boss. Nevertheless, she also uses spare time for Nordic walking, for passionate baking and for drinking coffee with friends.

„I’m rooted here. Leaving for a distant planet? No, I would have to take along so much that I could not handle it anymore. Therefore, I prefer to stay here.” Even if that means she has to deal with English contracts with 30 or more pages again and again: “Yes, sometimes I could really do without it!” But she knows an antidote: “My colleagues and my coffee are good for me” – one day at a time!” As she lives and learns: “That keeps fit and open minded” And: I in our company am equipped with the flexibility I need for my children.“

If you have questions about our topics, please [contact](#) us.

In the sense of our technical subject – we are happy to be here for you, even at temperatures below freezing.

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