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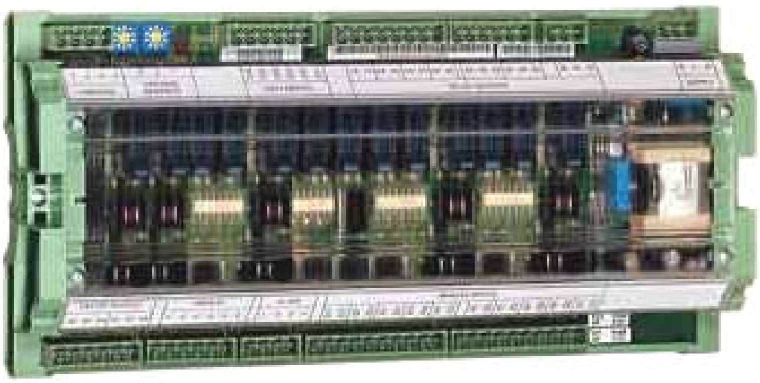
Power in the background –

Intelligent control technology for commercial refrigeration

Behind every great man is a great woman .... this is a popular quotation that can also be applied to the refrigeration sector. The Eckelmann company based in the German town of Wiesbaden, which sees itself as an automation partner with a great depth of performance, is one of the more discrete but nevertheless strong vendors of control and monitoring electronics. For some years now, one of its renowned customers has been Linde-Kältetechnik, a company based in the nearby Kostheim, for whom more than 10,000 components from the E-LDS system are manufactured every year. The system based on CAN bus transmission technology is being continuously enhanced. Current new features such as a control system to monitor electronic expansion valves as are used in $C0_2$-filled refrigeration circuits were presented at IKK 2003. E-LDS control systems are used for all areas of cold storage and presentation of foodstuffs. The scope of functions ranges from the simple controller to offline diagnosis via the Internet (TCP/IP protocol). Cooling point controllers and combined control systems capable of modular expansion work hand in hand in complex installations. The central components of the system are:

- Cooling point controller UA 300 for up to four units in a row in two temperature zones. Only one controller type is needed for cooling units, serving counters, deep freezing units and cool rooms/deep freezing rooms. Up to ten temperature sensors such as K243, K277 or 5K3A1 can be connected. Several controllers are merged in a master/slave configuration. A choice of a separate operator control unit, an operator control terminal, a market computer or output to the market or service computer or a laptop is available for setting the values and for reading out operating data. The controller communicates via the CAN bus and without electrical contact. All data is archived in the market computer.



Cooling point controller UA 300-CC

- Combined control VS 3000 for up to twelve compressors and twelve condensers. It is used in combined, liquid refrigeration and booster and satellite systems. The room and outdoor temperature and also the humidity in the market can be integrated into the control response. The unit's output end features six normally-open contacts and four changeover contacts (250 V/6A), which are potential-free, for compressors and analog closed-loop control, e.g. for speed control of fans. It also features 23 digital potential-free inputs to register the system's operating state and 15 connection possibilities for analog temperature sensors (Pt1000) as well as six inputs for pressure measurement. Thanks to a serial interface, it can communicate with industrial PCs, which facilitates integration in complex control and facility management systems (also available as the compact low-cost variant VS300.)

- Market computer CI 3000. This is a central programming, parameter definition and display station. It also serves as a message and alarm memory (also EU archive, with 2 MB or 6 MB capacity) and, if required, it will also manage the energy for other energy consumers in the market. RS-232 interfaces for PC operation locally and for data forwarding to the Internet via a modem are typical features that are being requested by increasing numbers of customers. Alarms are optionally visualised or forwarded with an internal buzzer, and LED display and signalling contacts.

Fig.: Market computer CI 3000

- This vendor also offers the LDSWin Version 2.1.4. software for control of the market computer. It serves both the purpose of local commissioning and monitoring and configuration in central control stations and service centres. The software is suitable for market computer testing, archiving, sending data by e-mail, data backup in a network and for creating and printing daily temperature lists (HACCP). The software is capable of running under numerous Windows operating systems.

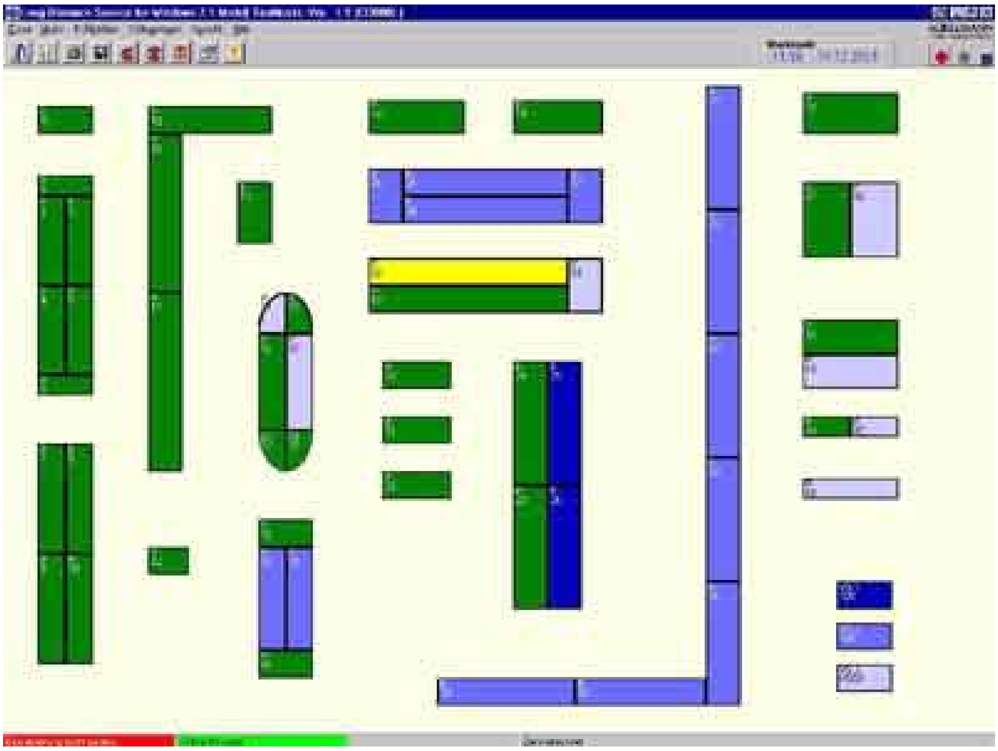


Fig.: Screenshot of a cooling point controller query page of the LDSWin software that is installed on the hardware

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