

## IP67 remote I/O: Control cabinet solutions “well packaged” is just not enough

While fieldbus technology is slowly finding more and more advocates in the process industry, bus structures have been established for a long time in the manufacturing automation field. Whether it is the remote IO in the control cabinet with IP20 degree of protection, or directly on the field or on the machine with IP67 degree of protection it is often a question of personal preference for the corresponding application. Turck customers can always find the right product range for every case and each application – from Remote I/O excom used in the process industry to the BL20 control panel solution to BL67 for harsh industrial environments.



**BL67 - up to 32 expansion modules can be added to the right of the gateway, without the requirement for a module rack or a mounting panel**

It is not simply enough to transform existing control cabinet solutions into a solution in an installation housing for direct mounting on the machine, in order to provide a high-performance I/O system for use in the field. This may reduce the cable lengths to the sensors but does not offer any particular advantages. It is still necessary to lead out the sensor cables, to put them through the cable glands and then to connect them to the IP20 bus terminals. And it is not always possible to avoid wiring problems which also additionally affects the very precious commissioning times. If the fieldbus nodes then have to be extended by a few signals, chaos may ensue. Further cable glands must be installed in the installation housing and in the worst case scenario no more space will be available in the housing.

Now at the very latest well-developed IP67 fieldbus devices come into play. It is only then possible to comprehensively implement the distributed automation technology concept with high-performance and flexible solutions constructed for IP67 application. Turck [1] has developed a modular system of this type with the BL67 whose fields of application can be extended continuously with new modules

### Modular IO system

The BL67 system consists of the gateway and the extension modules. The gateways are used for communication with the fieldbus and are available for Profibus-DP, DeviceNet, CANopen and Ethernet. Up to 32 expansion modules can be added to the right of the gateway, without the requirement for a module rack or a mounting panel.

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The base modules are passive components and are simply plugged into the system. The result is a compact and mechanically stable unit which can be expanded flexibly at any time. The electronic modules are plugged into the base modules and then fixed. Owing to the compact design of our BL67 components it is possible to mount the fieldbus station which saves space directly at the machine or the production line. This ensures short paths to the sensors/actuators and reduces the wiring effort and eliminates possible sources of faults by the use of premoulded cables.

**Comprehensive software support**

Turck supports BL67 users with the engineering, commissioning and maintenance with the free-of-charge software package "I/O-Assistant". This tool accompanies the user through all phases of the system. Even in the design stage of the modular fieldbus nodes the "I/O-Assistant" supplies useful information such as the types and designations of the required components and their ordering numbers. The possibility of graphically configuring the stations and immediately producing documentation including ordering lists, drawings, dimensional drawings and parameter lists, offers the user considerable savings in time and effort. At the same time incorrect configuration is avoided as the software will only indicate the logically useful base modules for the respective electronics modules and calculates the maximum total currents of the digital inputs and outputs.

During commissioning the user can read all digital and analogue inputs and set or provide values using the "I/O-Assistant".

In this manner the entire wiring and all sensors and actuators can be checked by a simple mouse click. The BL67 gateway is connected to the service PC via a serial cable to the RS232 interface. With the I/O-Assistant every fieldbus station can be tested preliminarily as a local unit which considerably reduces the commissioning time. If however problems still occur, the software can be used for diagnostic purposes. All diagnostics results are displayed directly in plain text.

Setting of the IP address is via rotary switch, BootP, DHCP or with the I/O-ASSISTANT. Status and diagnostics information of the gateway and the electronics modules actually connected can be accessed via the default website. In the future it will be possible to create your own websites and to download information to the gateway via FTP. Thus simple web visualization can be implemented quickly.

**New modules**

Further examples of BL67 development suitable for the market are interfacing modules for valve blocks. The latest BL67 expansions allow coupling of valve blocks from any manufacturer, either using a multipole M23 connector (12 or 19-pole) or via CAN bus. Integration of CAN stations is possible without any special CAN knowledge.

**BL67 goes Ethernet**

The Turck developers work continuously in further developing the BL67 components. In the meantime there are also Ethernet gateways available which provide the entire functionality of the I/O-Assistant for the entire Ethernet network. Thus all fieldbus stations can be maintained from a central point. The gateways which are currently available support the Modbus-TCP and Ethernet/IP protocols. A Profinet-IO version is also in development. The three gateways support 10/100 Mbit/s auto-negotiation and feature an integrated web server.

Parameterisation is implemented in the usual manner in the higher-level control via configuration files such as GSD, GSDML, EDS or via the "I/OAssistant".

Also new in the BL67 range is a 4-channel analogue input module, where the inputs can be used for both current and voltage. This presents double potential for savings, as the double signal density reduces both the stock requirement as well as the system dimensions. In the future, Turck will integrate further technologies into the BL67 I/O system. TURCK will be presenting the next highlights in this respect at the SPS/IPC/Drives fair in November 2006 in Nuremberg.

**Abbreviations**

BootP	Bootstrap Protocols
CAN	Controller Area Network
DHCP	Dynamic Host Configuration Protocol
EDS	Electronic Data Sheet
FTP	File Transfer Protocol
GSD	Generic Station Description
GSDML	GSD Markup Language