Spica Technology
Dual Display for turbine controller

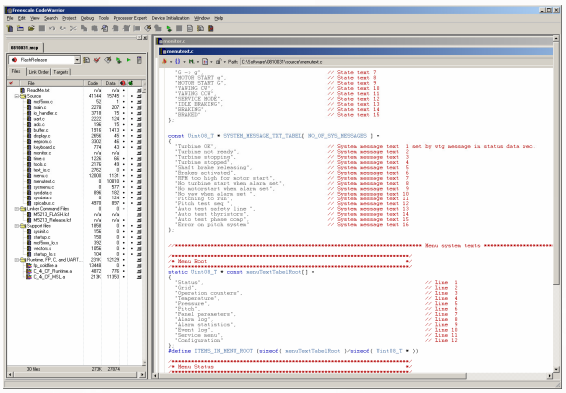
- **Simultaneous operation of two independent menu systems**
- **Roughed dual 4x40 chars HMI**
- **Extended temperature range (-25°C .. +70°C)**
- **Status indicators for e.g. Alarm, shaft speed, yaw etc.**

Durable & simple hardware design

The Spica dual display is designed for harsh climate conditions, long life time and high durability.
It can operate over a vide temperature range and is not sensitive to neither dust nor oil and can easily be operated with gloves.
All data and text is presented in two 4 lines / 40 chars dot matrix display with yellowish led back light and a temperature regulated contrast.
The keyboard is a durable foil type with a precise tactical and audible user feedback.
The two displays will navigate the same menu system, but can be at two different locations at the same time.
User selects one display for navigating the menu system and the other display will update its current menu location and data.
Meaning, it is possible monitor data feed back in one window while changing parameters in another.
The unit is flush mounted and by placing a neoprene seal between the display and cabinet, an IP 66 splash or water proof design can be obtained.
The Spica dual display has three sockets for connecting serial interface modules. Depending on the interface required, different communication modules for RS232, RS485, fiber or Ethernet, all galvanic isolated, can be placed in each socket
Up to 5 displays can communicate on the same data line and up to 10 if Ethernet is used.

Costumer or application adapted layout

The entire menu system is written in the language C.
The menu system it self is written in tabular form and decoded by the system software to form the functional menu system.
The tabular form costumer or application related adaptation as an integrated part of the software design.
It is simple to add or remove new menu items. No modification to the communication is needed when adding or removing menu items.
The application communicating with the display has full control of display indicators, menu status field and menu information field.
Each display unit communicates with a communication server located at the Host (typically a PLC).
The communication server holds a cross reference list of all data items to be exchanged between application(s) and displays.
When updating the menu system, the binary code file for the display unit is placed on the host.
The host will then update the menu system by flashing the display unit.



Communication model –Bachmann PLC

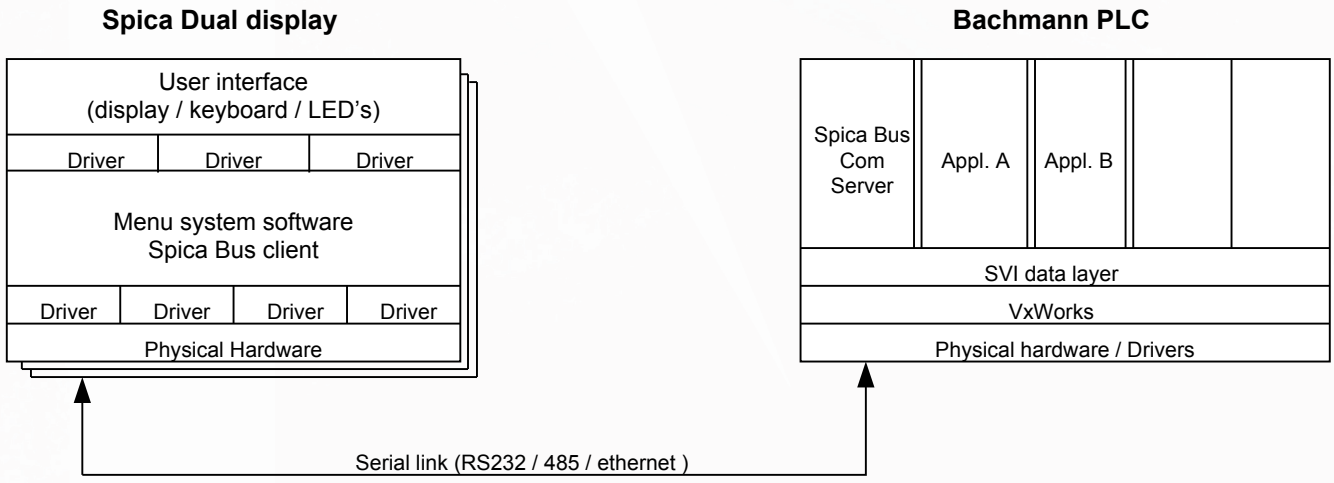
Data passed from PLC application(s) to display, is passed via a communication server running on the PLC. The communication server (data host) transforms application data into the data format used between display units and PLC.
The server will automatic detect any display attached to the communication port assigned to the communication server (Spica bus Comm. Server).
It will follow a predefined data exchange scheme called the SpicaBus. The SpicaBus identify all data by the use of data tags. The SpicaBus server holds a cross reference list of all data tags and SVI data to be exchanged between application and display.
When requested by the server, each display will ask for data tagged by displayed menu lines.
The spicaBus server will collect requested data by issuing SVI calls the application(s) assigned to hold requested data.
In this way, communication to displays is decupled from any critical application running on the PLC controller.
In case of a problem in the SpicBus task, the PLC application will not be influenced.
All data exchanged between display and PLC is in ASCII format and can be monitored or inspected by the use of a simple communication monitor.
Future use of the SpicaBus for exchange of data with remote SCADA systems or remote clients is also possible.

Menu structure

The menu system is easily navigated using Up/Down & Left/Right.
The root menu could look this:

Status
Grid
Operation counters
Temperature
Pressure
Pitch
Panel parameters
Alarm log
Alarm statistics
Event log
Service menu
Configuration

'Status' will show current production, wind speed etc. It is also the 'Default' menu e.i. from all other this menu will be called when the menu system times out.
To enter "Service menu" and "Configuration" a password is requested for each menu.
The password can be specified or altered from a secret super user menu
Service menu will hold a number of sub menu's for inspection of special data or manual control of e.g. pitch system if allowed by the application.
Configuration will hold a number of sub menu's in more levels for setting application parameters.



Technical Data

Input Voltage	+10..32Vdc
Power consumption	12W Max
Temp range	Operation: -25°C to +70°C Storage: -40°C to +85°C
Relative humidity	5..95% No condensation
Altitude	Max 4000m above sealevel
Enclosure	IP42 / IP66
Interface	RS232 / RS485 / Ethernet / Optical

Outline: