

Make or Buy?

The below table indicates a cost and time comparison between making a display controller device from scratch based on available source code products and the approach of creating a product solution based on the HMI-3570 design package provided by SYS TEC electronic.

| | Make | Buy |
|---|---|--|
| Hardware design; from specification to passing certifications | 4 engineers x 18 months 388.800 EUR | Design package available within 4 weeks 153.000 EUR |
| Integration of Linux OS, related drivers and IEC 61131-3 runtime system | 2 engineers x 3 months 32.400 EUR | Design package available within 4 weeks 42.000 EUR |
| Integration of CANopen Manager according to CiA 302 based on a available source code package | 2 engineers x 4 months 43.200 EUR | |
| Target visualization | 2 engineers x 4 months 43.200 EUR | |
| Re-work of device design | | 3 engineers x 3 months 48.600 EUR |
| Time and engineering cost to serial ready prototype | Invested time: 42 months Invested engineering: 507.600 EUR | Invested time: 4 months Total engineering cost: 243.600 EUR |

Ordering Information

| Order# | Available Packages and Products |
|----------|---|
| 13131900 | Design Package HMI-3570 |
| 13131910 | Design Package Option IEC 61131 (OpenPCS) |
| 13131920 | Production Quality Package |
| 13131930 | Design Package Option CANopen Manager C/C++ |
| 13131940 | Certification Package 2004/108/EC |
| 13139000 | Reference and Evaluation System MBC-1784 and HMI-3570 |

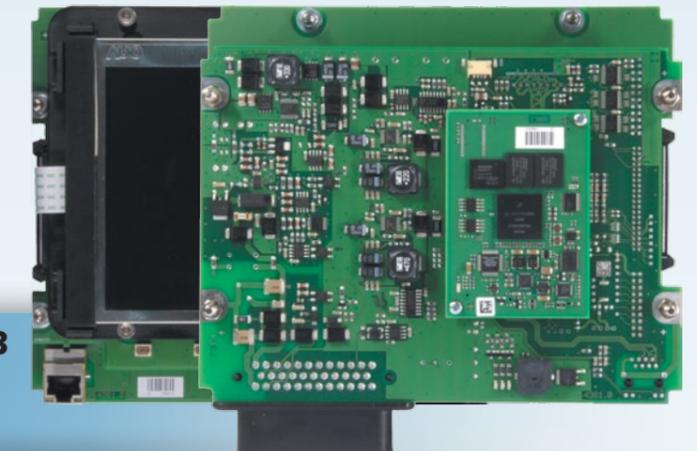
About SYS TEC electronic

SYS TEC electronic is a system house for distributed automation technology. We provide comprehensive services; from consulting to OEM integration.

Founded in 1990 in Germany SYS TEC electronic has more than 20 years experience in customized embedded systems development and industrial communication.

SYS TEC electronic offers a ready-to-use reference design of a human machine interface device as base for your own product developments. Using this design package will save you valuable time and efforts to develop and integrate into an market-ready device solution.

- Significantly shortens time-to-market
- Reduces effort for realizing own product designs
- Includes sourcing information for all components
- One-time buy-out fee; No royalties or product licenses
- Complementary design services and training available



The HMI-3570 reference design is meant for OEM that plan to develop own HMI and display controller devices for use in mobile machinery that is operating under harsh conditions.

The electronics used in the HMI-3570 reference design meet the requirements toward electromagnetic interference (EMI) as well as the temperature and mechanical stress that typically occurs in such applications.

SYS TEC electronic offers the HMI-3570 reference design as a design package. The HMI-3570 product design is finished and has already been verified. Thus customers that want to create own display controller solutions may directly use the design package and save valuable time.

The design material of the HMI-3570 reference design is delivered in source format, including the corresponding project files and the component libraries of the electronic components used in the design.

Customers can instantaneously start working with the design material to create own product

solutions. You may want to adapt the PCB to fit in an own enclosure or incorporate specific functionality into the design.

In addition to the hardware design material we also deliver the software design material necessary to operate the device. The design package includes a Linux board support package (BSP) that has been especially optimized to realize a very short boot-up time of less than 3 seconds from powering on the device.

With the design package we deliver a complete development environment (IDE) for own C/ C++ application development under Linux. The IDE is Eclipse-based and includes a target cross-compiler, debugger and reference projects. All IDE components are pre-integrated on a ready-to-use virtual machine.



Design Package Overview

(1) IEC 61131-3 with CANopen Manager and Target Visualization

This design package integrates an IEC 61131-3 runtime kernel with CANopen Manager and target visualization. It includes a pre-integrated IEC 61131-3 runtime environment specifically adapted for the hardware and software environment on the HMI-3570. The IEC 61131-3 runtime environment comes with a seamlessly integrated CANopen manager according to CiA specification 302. In addition the design package includes a ready-to-use target visualization. This target visualization perfectly integrates with the IEC 61131-3 runtime kernel and the underlying operating system. It comes with a special editor to create versatile user interfaces and supports a variety of standard features such as pictures, trend charts, tables, bar graphs or instruments. Beyond the standard features it is possible to create user-specific elements by grouping an assignment of elements in so-called Macro functions and reuse these Macro functions in other projects. A specific feature of this target visualization is the iGrafic element. Using this element in a page allows for displaying vector-based data from a file. For example could the iGrafic element could be used to display the position of a tool or machine part and update the data at runtime.

(2) Design package CANopen Manager C/C++

The CANopen Manager available with the add-on design packages allows for easy integration into CANopen functionality in own C/C++ applications. It supports automatic configuration of CANopen nodes at system startup and monitors their operational status. The CANopen Manager is fully compliant to CiA specification 302 and supports easy integration into own user-applications. This design package includes the CANopen Manager Source Code and demo applications specific to the HMI-3570 reference design. With this design package OEM may scale the CANopen functionality and offer flexible CANopen communication libraries to their customers.

Production Quality Package

Producing high volume serials at continuous high quality level requires sophisticated device tests and quality guidelines to follow throughout the assembly process.

SYS TEC electronic offers a special Production Quality Package that includes sophisticated end-of-line tests, technological informations and processing instructions to achieve that goal.

The Production Quality Package includes:

- Processing and Assembly flow chart
- SMD assembly processing instructions
- THT assembly processing instructions
- Mask and processing instructions for conformal coating of PCB
- Device assembly and finishing instructions
- Quality Assurance Checklist
- QA Certificate Template
- End-of-Line Test documentation
- Device test reference manual for test developers
- Test equipment manufacturing documentation (mechanical drawings, wiring schema, BOM, hardware)
- Automated test application for end-of-line device test (Labview runtime executable for Windows PC)

| | Design Package | Optional Packages |
|--|----------------|-------------------|
| Hardware Design Material | | |
| Schematic Diagram (Altium Designer Project) | X | |
| PCB Layout data (Mentor Expedition PCB project) | X | |
| 3D-Model of PCB (Step file, 3D PDF) | X | |
| Gerber Files | X | |
| Bill of Material with sourcing information | X | |
| Datasheets of key components | X | |
| Hardware Design Manual ⁶⁾ | X | |
| Prototype Assembly Instructions | X | |
| Software Design Material | | |
| Linux BSP (source code) | X | |
| U-BOOT bootloader (source code and binary) | X | |
| Target-specific drivers | | |
| CAN driver | X | |
| RS232 driver | X | |
| LCD driver | X | |
| I/O driver (e.g. LED backlight control) | X | |
| HID driver (keypad, scroll wheel, touch screen) | X | |
| Beeper driver | X | |
| SPI driver | X | |
| Watchdog | X | |
| System diagnostics (on-board temperature and voltage monitoring) | X | |
| Target Visu DataServer (binary only) ⁵⁾ | | (1) |
| Target Visu MicroBrowser (binary only) ⁵⁾ | | (1) |
| IEC 61131-3 runtime system ⁴⁾ | | (1) |
| CANopen Manager for IEC 61131-3 runtime system | | (1) |
| CANopen Library for C/C++ | | (2) |
| Reference Application for IEC 61131-3 with Target Visualization | | (1) |
| Reference Application for C/C++ | X | |
| Software Design Manual | X | |
| Documentation | | |
| Getting Started Guide | X | |
| HMI-3570 Device Manual | X | |
| IEC 61131-3 OpenPCS User Manual | | (1) |
| CANopen for IEC 61131-3 User Manual | | (1) |
| CANopen User Manual | | (2) |
| Spidercontrol PLC Editor User Manual | | (1) |
| Hardware | | |
| 3x HMI-3570 devices, assembled and tested | X | |
| Adapter cables for HMI-3570 | X | |
| USB/CAN interface (incl. driver CD for Windows PC) | | (1)+(2) |
| Software | | |
| IDE for IEC 61131-3 application development (OpenPCS Automation Suite) ²⁾ | | (1) |
| SpiderControl PLC Editor Extended ^{2) 5)} | | (1) |
| IDE for C/C++ application development ³⁾ | X | |
| CANopen Configuration Suite ²⁾ | | (1)+(2) |
| CAN-REport, CAN-bus Analyser tool ²⁾ | | (1)+(2) |
| Service and Support | | |
| 5-days workshop on customer site | | Optional |
| 6 months support via e-mail/phone | X | |

¹⁾ Labview is a product of National Instruments. The Labview runtime executable is executable under Windows 7 and does not require a Labview Developer License. However, in order to alter the Automated test control application a Labview Developer License is required.

²⁾ Delivered as binary executable ready for use on a standard PC running Windows 7 or higher

³⁾ Integrated Development Environment (compiler, linker, debugger, Eclipse IDE) for C/C++ application development in a ready-to-use VMware virtual machine

⁴⁾ The IEC 61131-3 runtime kernel is used under license from Infoteam Software GmbH, Bubeneuth, Germany. Delivery of IEC 61131-3 runtime kernel requires prior purchase of a Development License and a valid OEM contract must be signed with Infoteam Software company.

⁵⁾ The SpiderControl PLC Editor and Target Visualization MicroBrowser and the Dater Server are used under license from inNET GmbH, Muttentz, Switzerland. Prior delivery of the Target Visu software components a valid OEM contract must be signed with inNET company. Additional per device runtime fees apply for the Target Visu software installed on the HMI device. The SpiderControl PLC Editor software is licensed per seat.

⁶⁾ Enclosure design material not included in scope of delivery