FORBES MARSHALL

Controller Module

microcon Process Automation to Business Information

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Controller Module SX-201

Introduction

The CPU performs advanced process controls including, adaptive PID, dead time processes, cascade and feed forward control algorithms in conjunction with other microcon IO modules. Each CPU has a dedicated real time deterministic bus on which microcon IO modules communicate. The CPU also exchanges data with other control and communication devices on the SNET (Ethernet Base) and provides an effective environment to the user.

Features and Benefits

The CPU maximizes reliability with a single integrated hardware.

Integrated double precision embedded scalar and vector floating point units ensure high accuracy via floating point calculation in actual engineering units.

Increases availability by allowing incremental modifications of control algorithm without disturbing the existing one.

Plug n Play: supports online replacements with automatic boot on transfer programs enabling the user to replace the controller with any unit available with him.

The real time operating system software is toed in a 1GB flash not requiring an additional back up for data retention.

Facilitates the user with easy implementation of the process algorithm by providing choice of 5 different programming languages in accordance with IEC61131-3

Supports redundant IO Bus.

Supports redundant Gbit SNET for hi-level communication.

Contains 256 MB memory for the user programs.

Supports high temperature operation (upto to 60ºC) with temperature diagnostics that detect whether the module is operating outside of these limits.

Supports additional two COM ports and two ethernet ports for easy third party connectivity (Optional).

Supports upto 2200 Control IO and 3000 data acquisition IO points.

Easy fault finding with indications for all the communication channels, for ease in fault finding.

Reduces servicing time by allowing the module to be inserted or removed while powered, without disturbing field wiring.

Complies with the European Union's electromagnetic compatibility (EMC) directive, which requires process control equipment to be immune to electro-magnetic interference (EMI) and limits the amount of electromagnetic emissions.

Communication

All communication with the microcon IO modules is accomplished via a redundant IOBUS. The IOBUS is a master slave 12 Mbps serial data communication bus that employs synchronous protocol and conforms to the requirements of EIA/EN 61805 standards of RS 485. A rack to rack redundant bus can span distances up to 1300 feet (400m) on copper.

The IOBUS is immune to IO module failures such that no single failure in any module can cause both segments of the redundant IOBUS to become inoperable.

Local Termination

Local termination wiring is brought on a back plane so that on line removal of CPU does not call for removing and joining the cables again.

This increases system availability.

Remote / Local Redundancy

The CPU has a facility to implement redundancy in two modes, remote and local.

In local modes both the controllers can sit on a common back plane to facilitate redundancy in a compact and cost effective manner.

Wherever required, the CPU can also be installed at different locations to minimize the common cause of failures for critical applications.

Environmental Strengths

Temperature/humidity

Like all microcon modules, the CPU can be operated in a 0 to 60ºC temperature range with 0 to 95% relative humidity (non condensing) and stores in -20 to 80ºC temperature range with 0 to 100% relative humidity.

Corrosion Resistance

Like all microcon modules, the CPU employs the following to protect against corrosion from air borne contaminants:

All sensitive components of the module are conformably coated using a digital ray application device for guaranteed coating uniformity and coverage.

All module connectors employ pins designed to make gas tight connections with their mating counterparts and precoated with a special corrosion resistant lubricant.

Most connectors in the system use, gold plated contacts.

Optionally each module is enclosed in a metal assembly, which is designed to minimize external air from contacting the surface of the electronic assembly.

Controller Module SX-201
Technical Specifications

Description	Specifications
Module level	
Processor	Power PC of 1 GHz speed with double precision embedded scalar and vector floating point APU
Cache	Integrated 512 KB L1 and 256KB L2 cache
IO Co Processor	
Boot Program	16 MB boot flash
Memory	
Retentive memory	128 KB FRAM non volatile
Program memory	256 MB program memory (Total 512 MB SDRAM DDR2)
NANd (Program Resident Memory)	1 GB NAND Flash (256 MB for user application software)
Real time clock	Yes, supported
Communication buses	
S-Bus	Redundant G bit ethernet
IO-Bus	Redundant 12 Mbps RS 485 interface
IO-Bus Third party interfaces	
Serial Port 1 & 2	Configurable ES 485 interface for modbus master and slave
Ethernet	100 Mbps (Modbus TCP/IP)
Environmental	
Ambient temp range operating	0 to 60º C
Storage	-40 to 60º C
Relative humidity	
Operating	0 to 95% non condensing
Corrosives	Class G3 10 + years (optional)
Product grade	Industrial

Some Areas of Expertise

Pharmaceuticals

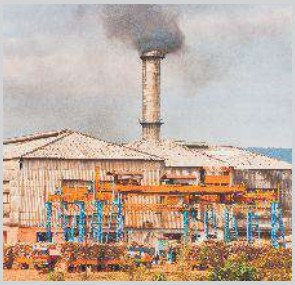
Forbes Marshall has vast experience in providing specialized control systems for Pharmaceutical Industry with specific application areas of fermentation biotechnology, bulk drug batch reactors, solvent recovery distillation columns and formulations. Special control algorithms are developed for pH and batch reactor temperature control, apart from batch and recipe management schemes.

Boiler and Turbine

Various references exist for different types of fuel fired boilers right from sugar to chemical industries including power boilers and turbine controls for both captive and thermal power stations. Boiler efficiency package, boiler load sharing packages, blow down control, feed water management system etc. are also provided. Special techniques are available for combustion control even in case of solid fuels like bagasse.

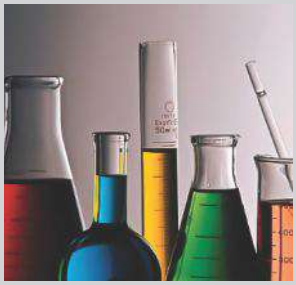
Sugar

Apart from the normal boiler control packages, specific packages have been developed for automatic cane feeding control / mill automation, imbibition water, juice flow stabilization, lime sulphitation pH control, evaporator controls and automation for both batch and continuous pans. Complete package solution with field instrumentation for plant-wide control right from mill to bagging is available.



Chemicals

Specialized control systems have been developed for both batch and continuous chemical applications. Various types of distillation column control techniques and specific batch and recipe management techniques provide ideal solutions for the chemical industry. Special range of analysers to monitor various online parameters are also available.



Steel

A large number of Forbes Marshall systems are in operation both for integrated steel plants as well as mini steel mills. Forbes Marshall has systems for water injection, steam injection, coal tar injection, heavy oil substitution (partial) for coke in blast furnace. Gas mixing stations for steel converters, VD / VAD / VOD in steel refining, pickling line automation, jet wiper system for galvanising line, continuous casting machine automation and industrial gas flow-metering systems.

Paper

Forbes Marshall provides specialized solutions for the paper and pulp industry. Some of the applications include digester automation, stock preparation, chemical addition, head box controls and paper machine controls. Solutions include a highly beneficial Thermocompressor system for steam and condensate management. Forbes Marshall systems have been successfully integrated with QCS systems to generate the setpoints for consistency / basis weight control.

Oils and Fats

Specialized packages have been supplied for edible oil refining, fatty acid and soap manufacturing systems both in India and abroad. The system includes packages for FAT splitting, fatty acid distillation, glycerin distillation, sweet water evaporation, crystallizer controls, perfume dosing system for soap making.

Food and Beverages

Specialized large jobs done on active dry yeast manufacturing, fish paste preparation, tobacco dryers, soft drinks, egg powder, dairies and there are also several references for alcohol distilleries and breweries including specialized packages for biogas effluent treatment plants.

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