Ethernet enabled Diagnostic Hub, with Door Condition Monitoring

o Powerful on-board 32-bit ARM processor
o Parallel processing capability using an FPGA
o Quick and easy installation c. 15 minutes per door
o Non-intrusive to other safety systems
o Self referencing with simple calibration
o Full displacement profiling
o 24V dc power supply or 802.3af Power Over Ethernet
o Remote firmware upgrades over Ethernet
o 1Gb expandable solid state memory (micro SD Card)
o Real-time clock, with backup battery
o Rapid configuration via easy to use Windows based API

Introduction

The Instrumentel Diagnostic Hub integrates the functionality of a data logger with that of a communications bridge and embedded processor to provide a compact, rugged and cost effective solution to industrial monitoring activities. As such it can not only sample data from a variety of sources but can also store and process data; thus enabling users to more effectively control and manage data distribution. As would be expected, the Diagnostic Hub is capable of acquiring and analysing, on-board, typical parameters such as stress, strain, displacement, temperature and humidity. Other application specific, analogue or digital signals can be sampled or controlled via general purpose inputs and outputs (GPIO) respectively.

The Diagnostic Hub has been deployed systematically in a the Automotive, Nuclear and Defence industries; which use the Diagnostics Hub not only to sample data, but to control and process the transmission of data over various network infrastructures. A recent addition to the portfolio is the Rail industry where the Diagnostic Hub has been used to acquire data pertaining to the condition of automated doors, as well as data associated with passenger comfort, i.e. HVAC system monitoring.

The Diagnostic Hub is a versatile electronic system allowing access to a range of customer specific modules and devices designed by Instrumentel. Importantly the Diagnostic Hub also provides a cost effective means of networking third party products and instrumentation. The Diagnostic hub is offered as an expandable system, which the user can configure, with or without Instrumentels' help, to achieve the desired functionality.

The Door Diagnostic System augments the standard Diagnostic Hub with the ability to monitor automated door movement. The movement of each door can be stored in the Hub's on–board memory, in the form of a profile. Subsequent door movement profiles can be compared with a reference profile, to establish changes in door movement. The resulting data can be examined in its' entirety or it can be processed to provide go, no-go status signals. The status flags, the data in a summary format or the raw sampled data may then be accessed in a manner, as determined by the user, over the specified network, e.g. wired or wireless Ethernet.

The Door Diagnostic sub-system is a standard integral part of with the Diagnostic Hub. This reduces the cost of the door monitoring activity, yet at the same time maximises the utility of the Hub.

Specifications

LAN

Ethernet: 1 x 10/100 Mbps, RJ45
Protection: magnetic isolation
Protocols: TCP/IP, Telnet, HTTP, DHCP, UDP, TFTP

Processing Capability

Processing: Embedded 32bit ARM processor, FPGA for parallel processing and DSP
Program Memory: 256kb Programmable Flash, 64kb Program RAM
Data Storage: Solid state Memory, µSD card 1gb as standard, fully expandable
Firmware: Upgradeable via Ethernet Boot-loader
Interfacing: Serial, SPI, Analogue to Digital converters, Event Triggered IO and Programmable Hardware counters.
Expandability: Expansion header for extended capability available via personality boards
Additional Capability: Real Time Clock (RTC) with backup battery

Door Sensor Interface

Sensor Interface: Industrial Standard RFID, ISO 15693.
Operating frequency: 13.56MHz
Firmware: Instrumentel IP core allowing movement profiling and extended tag read range, ISO 15693 compatible.
Read range: Under the influence of metal >8.5cm, Normal operating read range > 12cm
Sample Rate: 15ms-1
Additional Features: Self referencing with simple calibration through Windows based API, Full motion profiling, Fast Sampling> 65 Samples/ s

Door Sensor Strip

Dimensions: Customer preference
Number of Tags: Six industry standard tags, for optimum resolution.
Compliance: Can be made using CAT-1B complaint material
Fitment: VHB tape or other acceptable adhesives

Power Requirements

Power: DC Power Connection or ISO 802.11afPOE (Power over Ethernet)
Power Input: 24 VDC nominal, 12-80 VDC

Environmental Limits

Operating Temperature: -25 to + 65 ^{0}C
Storage Temperature: -40 to +85 ^{0}C
Ambient Relative Humidity: 5 -95% (non-condensing)

Product family

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