

C715612 : MAJOR ELECTRICAL ENGINEERING

KEY WORD: GAS SENSOR / DATA ACQUISITION

OPAS SIRICUNCHITTAVON : A DATA ACQUISITION SUBSYSTEM FOR THE REMOTE AIR MONITORING SYSTEM. THESIS ADVISOR : SUVIT NAKPEERAYUTH, THESIS COADVISOR : ASSIST. PROF. MANA SRIYUDTHSAK, Ph.D. 78 pp. ISBN 974-636-784-6

This research has developed a data acquisition subsystem for the remote air monitoring system. The small, stand alone remote module can preprocess the signal before sending to the host computer via modem to reduce the amount of transmitted or stored data and host computer burden. Host computer can connect to several remote modules using ASCII protocol to control the operations. The host computer's program was developed with Visual Basic under Microsoft Windows 3.1 to use the multitasking capability. The remote module's program was developed with assembly language on TMS320C50 DSP chip for small and fast program.

The remote module can connect up to 5 gas sensors with one 8 bits digital output port to control solenoid valves. It has 2 operation modes: basic mode, sending voltage from gas sensors and advance mode, sending inner products between data vectors of each sensors and reference vectors of 256 points. Up to 4 reference vectors can be downloaded for each sensors. Using the calibration matrix as reference vectors, the gas concentrations can be computed.

The system has been tested with the vapor from ammonia and methyl alcohol solutions at 0.01%, 0.05%, 0.1% v/v and pure water. The calibration matrix using principal component regression (PCR) gives the rms error on test data less than 2.6077% when using 7 principal components. The on-line testing via modem with 2 remote module to measure and calculate gas concentrations work as desired.

ภาควิชา..... วิศวกรรมไฟฟ้า.....

สาขาวิชา..... วิศวกรรมไฟฟ้า.....

ปีการศึกษา..... 2539.....

ลายมือชื่อนิสิต..... โทดาส์ อภิธรรมกุล.....

ลายมือชื่ออาจารย์ที่ปรึกษา..... อ. ลอริส.....

ลายมือชื่ออาจารย์ที่ปรึกษาร่วม..... อ.ม. อภิธรรมกุล.....