MCS Electronic BOX

Hardware

- **ADAM-6015** (x1) with RTD sensors (1x7)
  http://www.omega.com/pptst/RTD-830.html
  http://buy.advantech.com/Remote-I-O-Modules/Ethernet-I-O-Modules-Analog-IO-Modules/model-ADAM-6015-BE.htm?country=USA&token=636372260221909922&f=ATW&f=AUS
- **Liquid Flowmeter**
  http://www.omega.com/pptst/FPR301_302_303_304.html
- **Arduino ethernet board**
  This board is used to read the liquid flowmeter
- **Aviosys IP Power 9858DX**
  http://www.aviosys.com/downloads/manuals/power/9858DX-V1.0B.pdf
- **USB microphone with USB sound card**
  http://www.panasonic.com/in/consumer/tv-audio-video/accessories/microphones/rp-vc201.html
  http://www.galileo.com.tw/USB51A.html

Aviosys IP Power 9858DX

IP Power 9858DX is a new generation of the Power Distribution Unit (PDU) & Remote Power Control (RPC) system. Its able to connect to the WiFi network plus WPS function for easy & quick set up a device to user's wireless home/office network and control in the network.
With embedded web server and HTTPS protection , 9858DX supports higher grade security as working on Internet. User can control power easily and more safely through the web browser on Windows PC or on Smartphone like Internet Explorer (IE) , Firefox , Google Chrome , Safari (iOS) and Android system.
9858DX allows user to remote control power up to 4 separate devices on/off via network . As support SSL & SNMP, user can use public email like Gmail / Hotmail / Yahoo Mail to get the email as the ON/OFF status change . User can also control by e-mail without doing port forwarding / port mapping and search the other IP Device in webpage directly.

IP: 10.1.120.91
MAC: 00:98:58:00:14:f6
user: admin
pass: 12345678

POWER 1	Metrology camera
POWER 2	Shutter, Adam6015, Flowmeter
POWER 3	Cisco 2960CG
POWER 4	PC, Cooling fans

Arduino ethernet board

This board collect the data from flow meter. We can program it to use DHCP or static IP.

IP: TBD
MAC: TBD

There are two ways to read the data:

• **Telnet protocol**

Only support 'Q' command for query.

telnet 10.1.120.12
:*Q*
Flow = 0 Hz
:*X*
unknow

• **SNMP protocol**

snmpwalk -c public -v 1 10.1.120.12 1.3.6.1.4.1.50399
SNMPv2-SMI::enterprises.50399.1.0 = STRING: "Subaru MCS telemmetry sensors"
SNMPv2-SMI::enterprises.50399.2.0 = STRING: "1.3.6.1.4.1.50399"
SNMPv2-SMI::enterprises.50399.3.0 = Timeticks: (6500) 0:01:05.00
SNMPv2-SMI::enterprises.50399.4.0 = STRING: "ChihYi Wen"
SNMPv2-SMI::enterprises.50399.5.0 = STRING: "Telemetry sensors"
SNMPv2-SMI::enterprises.50399.6.0 = STRING: "Subaru"
flow meter (x100, Hz)
SNMPv2-SMI::enterprises.50399.7.0 = INTEGER: 0
number of services
SNMPv2-SMI::enterprises.50399.8.0 = INTEGER: 7
End of MIB

snmpget -c public -v 1 10.1.120.12 1.3.6.1.4.1.50399.1.0
SNMPv2-SMI::enterprises.50399.1.0 = STRING: "Subaru MCS telemmetry sensors"

snmpgetnext -c public -v 1 10.1.120.12 1.3.6.1.4.1.50399.6.0
SNMPv2-SMI::enterprises.50399.7.0 = INTEGER: 0

Adam 6015

The ADAM-6015 is a 16-bit, 7-channel RTD input module that provides programmable input ranges on all channels. It accepts various RTD inputs (PT100, PT1000, Balco 500 & Ni) and provides data to the host computer in engineering units (°C). In order to satisfy various temperature requirements in one module, each analog channel is allowed to configure an individual range for several applications.

There are total three such modules inside EBox, so we have total 3x7=21 RTD sensors. This module supports Modbus/TCP Protocol and following is the function to read RTD sensors. A python module has been built to get the temperature readings. It doesn't support DHCP and SNMP protocols.

IP: 10.1.120.91
MAC: TBD

Function Code 03/04

The function code 03 or 04 is used to read the binary contents of input registers

Request message format for function code 03 or 04:

Command Body					
Station Address	Function Code	Start Address High Byte	Start Address Low Byte	Requested Number of Register High Byte	Requested Number of Register Low Byte

Example: Read Analog inputs #1 and #2 in addresses 40001 to 40002 as floating point value from ADAM-6017 module

01 04 00 01 00 02

Response message format for function code 03 or 04:

Example: Analog input #1 and #2 as floating point values where AI#1=100.0 and AI#2=55.32

01 04 08 42 C8 00 00 47 AE 42 5D

USB microphone

This device can be used directly in Ubuntu 14.04. In the following we demonstrate how to use ALSA utility to record sound.

```
> lsusb
Bus 008 Device 004: ID 0d8c:0139 C-Media Electronics, Inc. Multimedia Headset [Gigaware by Ignition L.P.]

> cat /proc/bus/input/devices
I: Bus=0003 Vendor=0d8c Product=0139 Version=0100
N: Name="C-Media Electronics Inc.      USB PnP Sound Device"
P: Phys=usb-0000:03:00.0-2.1/input3
S: Sysfs=/devices/pci0000:00/0000:00:01.0/0000:01:00.0/0000:02:01.0/0000:03:00.0/
usb8/8-2/8-2.1/8-2.1:1.3/0003:0D8C:0139.0004/input/input8
U: Uniq=
H: Handlers=kbd event5
B: PROP=0
B: EV=13
B: KEY=1 0 0 e000000000000 0
B: MSC=10

> arecord —list-devices
**** List of CAPTURE Hardware Devices ****
card 1: Device [USB PnP Sound Device], device 0: USB Audio [USB Audio]
  Subdevices: 1/1
  Subdevice #0: subdevice #0

# record sound for 20s
> arecord -f cd -D hw:1,0 -c 1 -d 20 test.wav
```