OTT Sensors and InfluxDB

what and how we have collected data so far

Outline

- Sensors Overview
  - Technical Data
  - Accuracy/Limits
- Data Overview
  - Pluvio S
  - Pluvio L 400
  - Parsivel
  - WS100
- Data Logger Scripts
  - Pluvio
  - WS100
- Data Visualization

Location

All installed at the north corner of CERB roof floor

Weighing Rain Gauge (Pluvio S)

Weighing Rain Gauge (Pluvio L 400)

Laser Weather Sensor (Parsivel)

Radar Precipitation Sensor (WS100)

Technical Data

	Precipitation Type	Collecting Area	Measuring Capacity
Pluvio S	Liquid, Solid, Mixed	200 cm^2	400 mm
Pluvio L 400	Liquid, Solid, Mixed	400 cm^2	750 mm
Parsivel	Liquid, Solid, Mixed	NA	Unlimited
WS100	Rain, Snow	NA	Unlimited

Intensity Accuracy/Limits

	Unit	Accuracy	Resolution	Measuring Range
Pluvio S	mm/h	±6 or 1%	0.01	6.00 – 3,000.00
Pluvio L 400	mm/h	±6 or 1%	0.01	6.00 – 3,000.00
Parsivel	mm/h	±5% (Liquid) ±20% (Solid)	0.001	0.001 – 1,200
WS100	mm/h	Unknown	0.01	0.01 – 200

Accumulative Accuracy/Limits

	Unit	Accuracy	Resolution	Measuring Range
Pluvio S	mm	±0.1 or 1%	0.001	0.030 – 500.000
Pluvio L 400	mm	±0.1 or 1%	0.01	0.05 – 500.00
Parsivel	mm	Unknown	0.01	0.01 – 300.00
WS100	mm	Unknown	0.01	0.01 – 100,000.0

Liquid Particle Measuring Range

	Paticle Size	Size Classes	Particle Speed	Speed Classes
Parsivel	0.2 – 8 mm	32	0.2 – 20 m/s	32
WS100	0.3 – 5.0 mm	11	NA	NA

Pluvio S Data

	Measuring Range	Output Delay Minute(s)
Intensity RT	6.000 – 3,000.000 mm/h	< 1
Accu RT/NRT	0.030 – 500.000 mm	1 – 65
Accu NRT	0.030 – 500.000 mm	5 – 65
Accu Total NRT	0.030 – 500.000 mm	5 – 65
Bucket RT	7.000 – 400.000 mm	< 1
Bucket NRT	7.000 – 400.000 mm	5

Pluvio L 400 Data

	Measuring Range	Output Delay Minute(s)
Intensity RT	6.00 – 3,000.00 mm/h	< 1
Accu RT/NRT	0.05 – 500.00 mm	1 – 65
Accu NRT	0.05 – 500.00 mm	5 – 65
Accu Total NRT	0.05 – 500.00 mm	5 – 65
Bucket RT	20.00 – 1,800.00 mm	< 1
Bucket NRT	20.00 – 1,800.00 mm	< 5

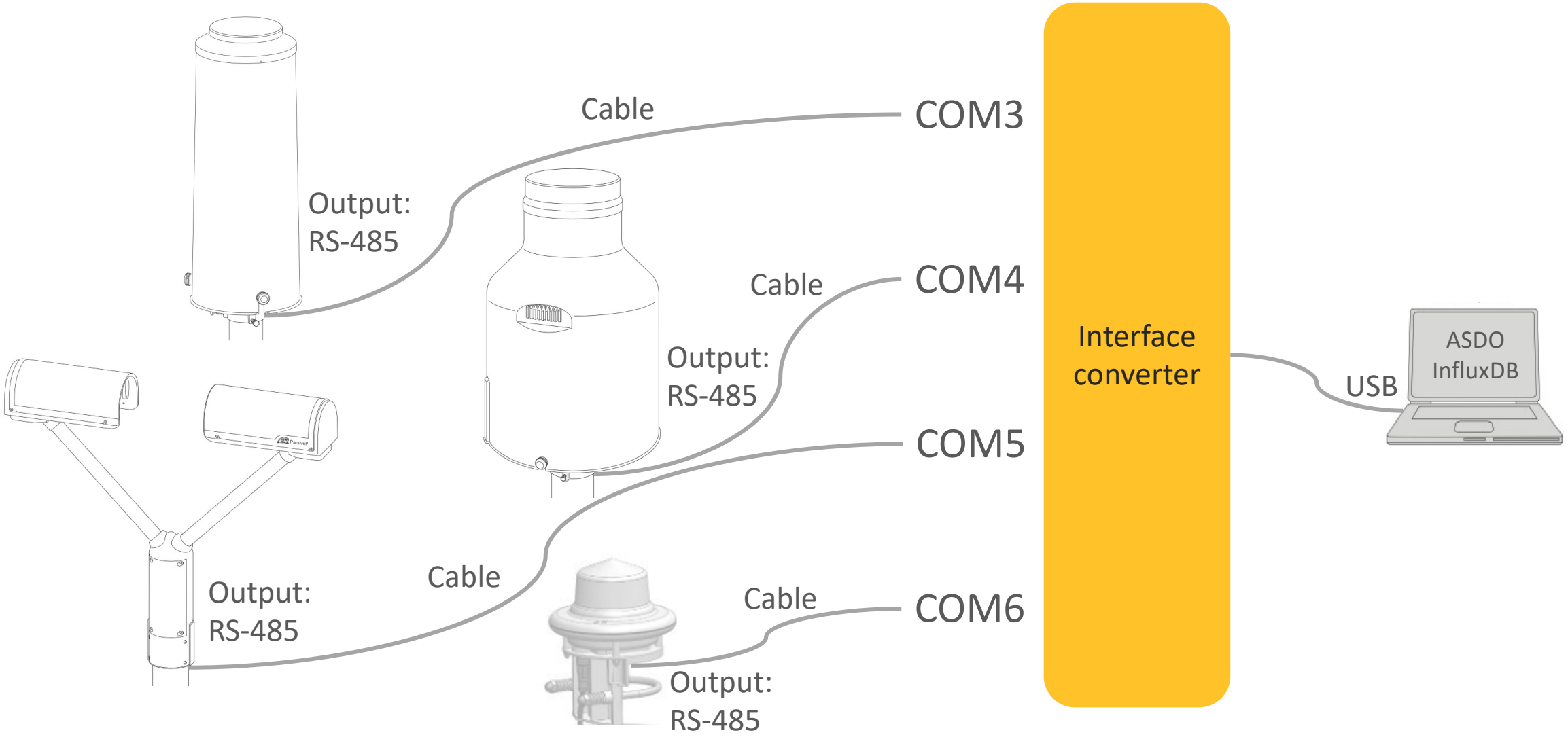
Parsivel Data

	Measuring Range	Measuring Interval Seconds
Intensity of Precipitation	0.000 – 9999.999 mm/h	10
Precipitation since Start	0.00 – 300.00 mm	10
Number of Detected Particles	0 – 99999	10
Kinetic Energy	0.000 – 999.999 dBz	10
Spectrum	0 – 999	10

WS100 Data

	Measuring Range	Sampling Rate Minute(s)
Precipitation Quantity-Absolute	0.01 – 100,000 mm	Event-dependent
Precipitation Quantity-Differential	0.01 – 100,000 mm	Event-dependent
Precipitation Intensity	0.01 – 200 mm/h	1
Temperature	-50.0 – 60.0 °C	1
Precipitation: Total Drops	0 – 4,294,967,295 Events	Event-dependent
Precipitation: Drop Class (0 – 11)	0 – 65,535 Events	Event-dependent

Connection of Sensors



InfluxDB Client Libraries

- Arduino
- C#
- Go
- Java
- JavaScript (Browser)
- Kotlin
- Node.js
- PHP
- Python
- R
- Ruby
- Scala
- Swift

Data Logger Script for Pluvio

- Open serial port
  - Use library serial
- Wait until next 1 minute
  - Use libraries datetime, timedelta
- Send request to sensor
  - Use library serial
  - Encode to ASCII
- Get response from sensor
  - Decode from ASCII
- Write data into influxDB
  - Use library influxdb_client

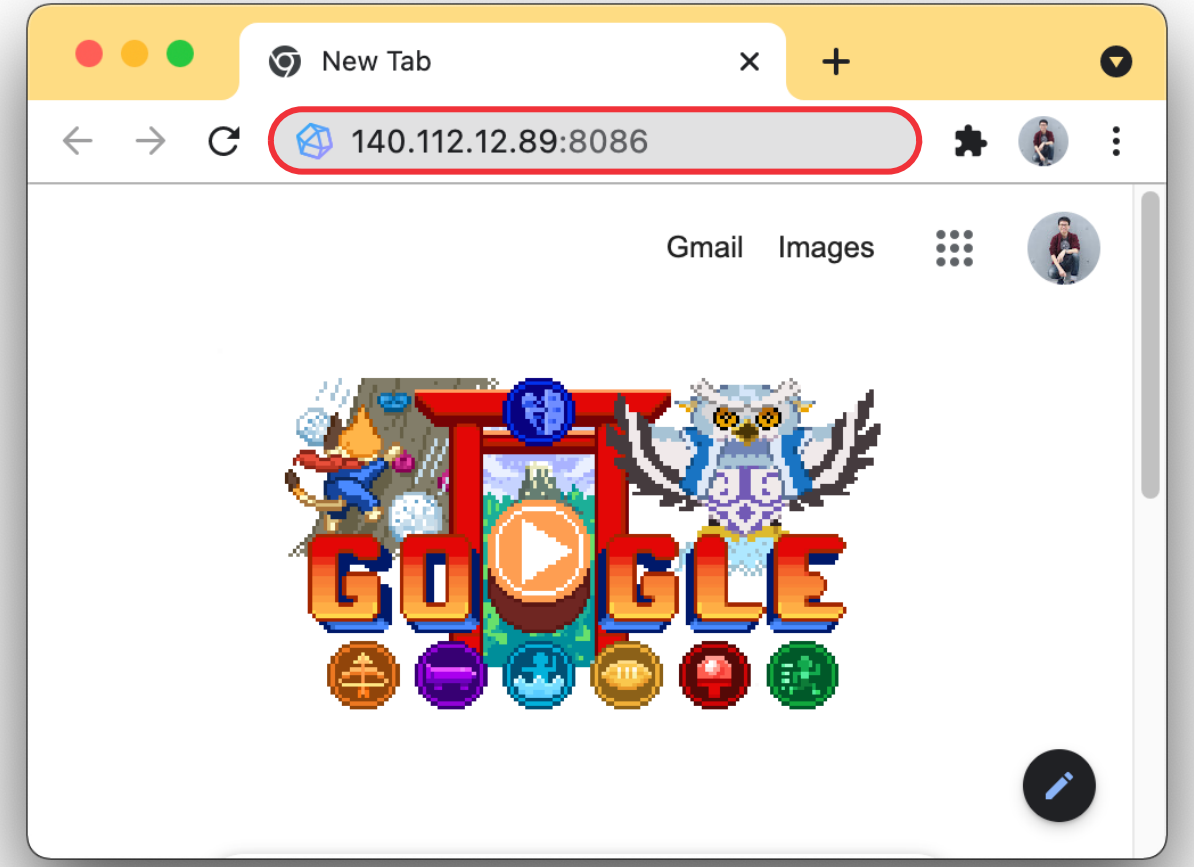
Script available
@NTU-CompHydroMet-Lab/RainGaugeLogger

Data Logger Script for WS100

- Configure serial port
  - Modify class WS_UMB
- Wait until next 1 minute
  - Use libraries datetime, timedelta
- Send request to sensor
  - Use onlineDataQuery()
- Get response from sensor
- Write data into influxDB
  - Use library influxdb_client

Script available
@NTU-CompHydroMet-Lab/RainGaugeLogger

InfluxDB Login



- Username: letitrain
- Password: cErbL8806

Data Visualization