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The clear path to operational excellence

UTAdvanced™

UTAdvanced

Simple Batch Controller
Building ladder program

2010 – July

YHQ NetSOL

YOKOGAWA

Wiring to connect LL50A to PC

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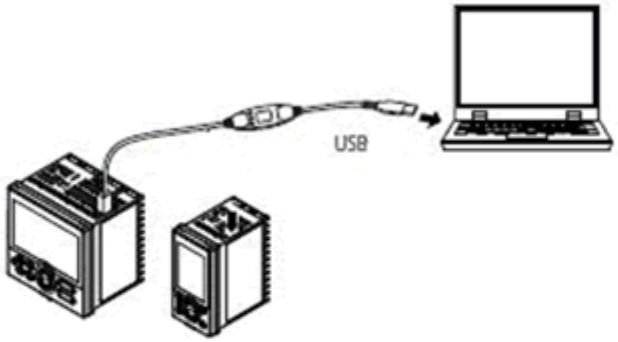
- Connect PC with Ethernet cable or USB dedicated cable
- For USB dedicated cable, USB driver installation is required. Specify the folder where driver is saved.

Preparation: Set IP address of PC

Connect with dedicated cable



192.168.100.1 or 192.168.100.2

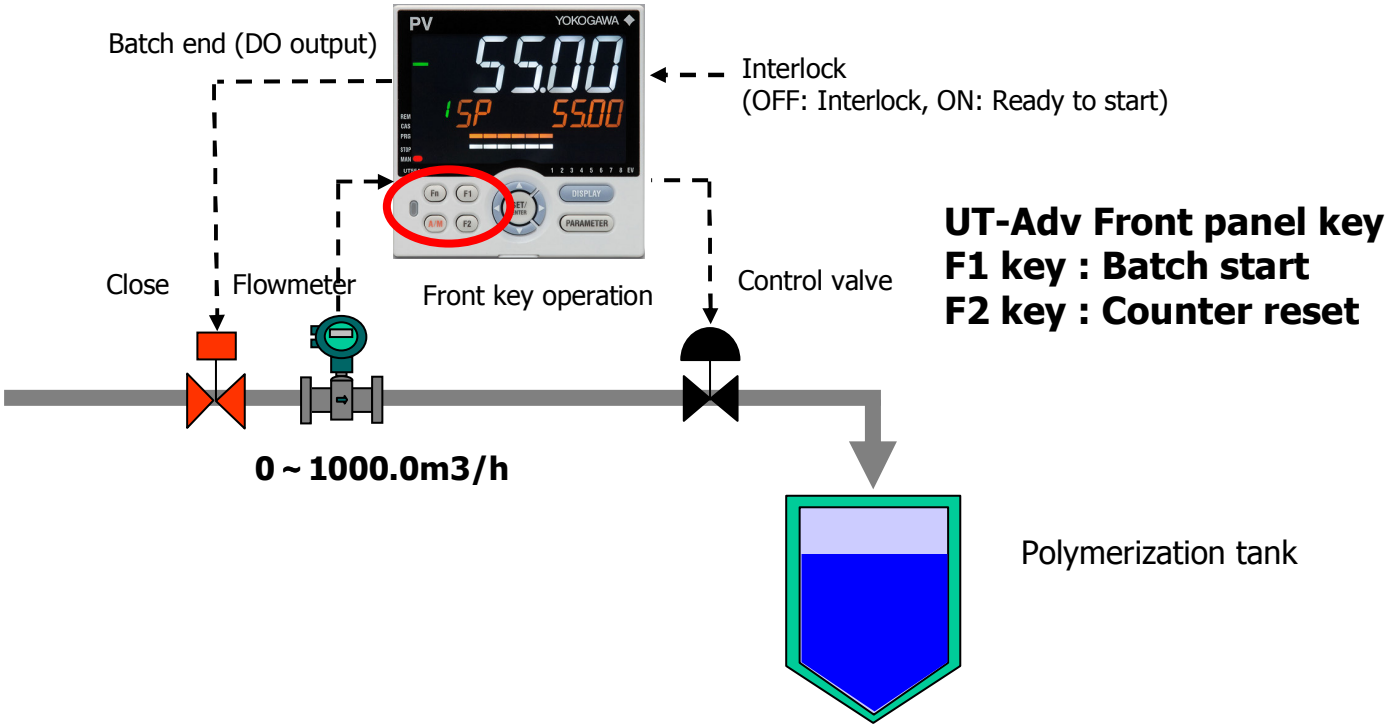
255.255.255.0

192.168.100.100

255.255.255.0

Model with Ethernet option can be connected with LAN cable

Hands-on (1) Simple Batch Control



Build ladder program for simple batch control to conduct both flow control and flow integration at the same time.

- **For the control of material blending or product shipment**
- **Automatic stop on set point**

Hands-on (1) – Building Ladder Program (1)

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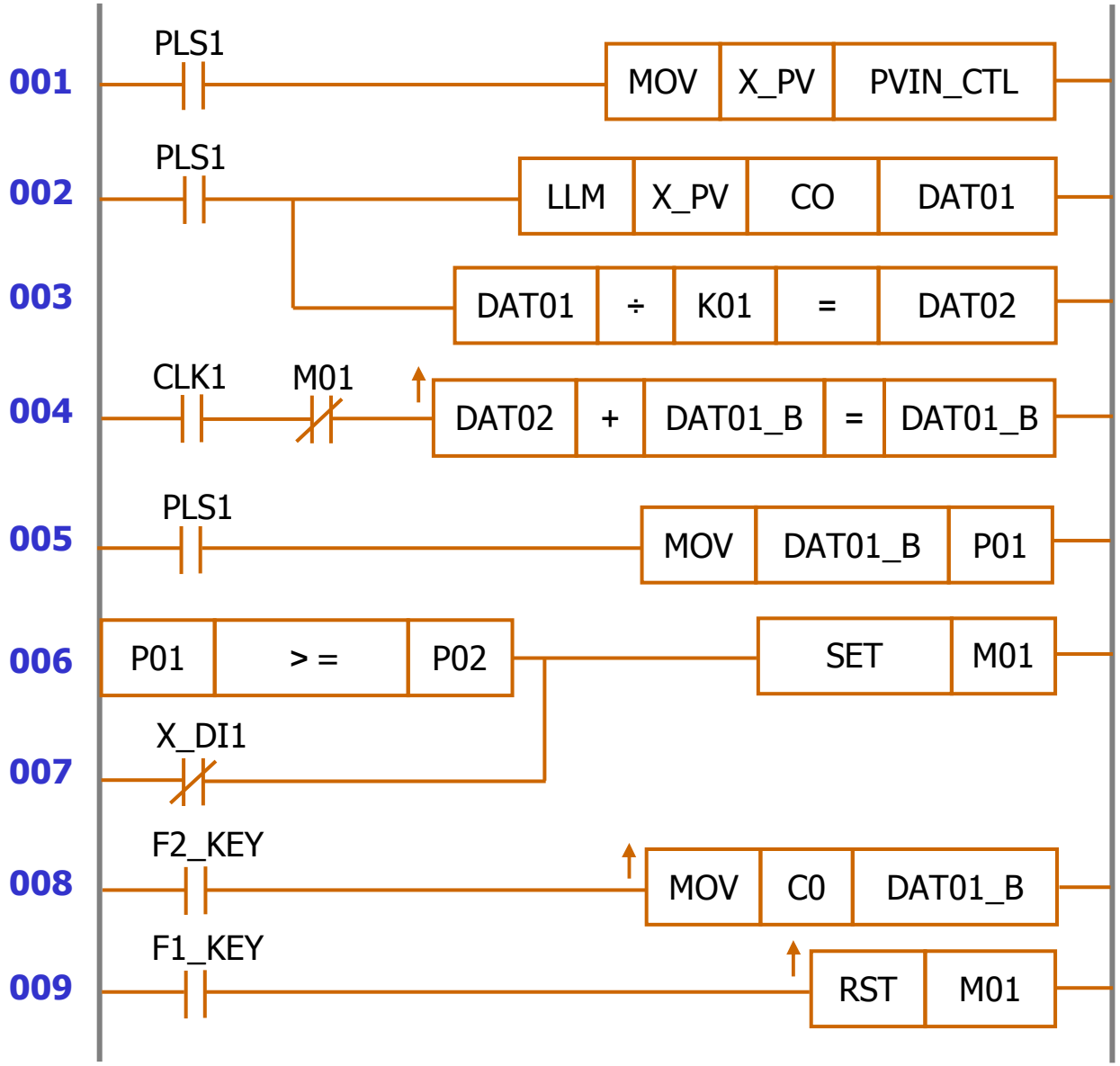

Input ladder calculation

Captured in input ladder processing MOV instruction

Low limiter LLM instruction

Division (Divide with 3600) OR connection - DIV instruction

Integration (E_ADD instruction) (M01 "b" contact : normally not necessary)

Move to P register MOV instruction (for integration counter display)

Comparison (GE instruction)

Interlock processing LD instruction-OR connection line

Integration counter reset E_MOV instruction

Batch start E_RST instruction

Hands-on (1) Download & Execute Monitor Ladder Program

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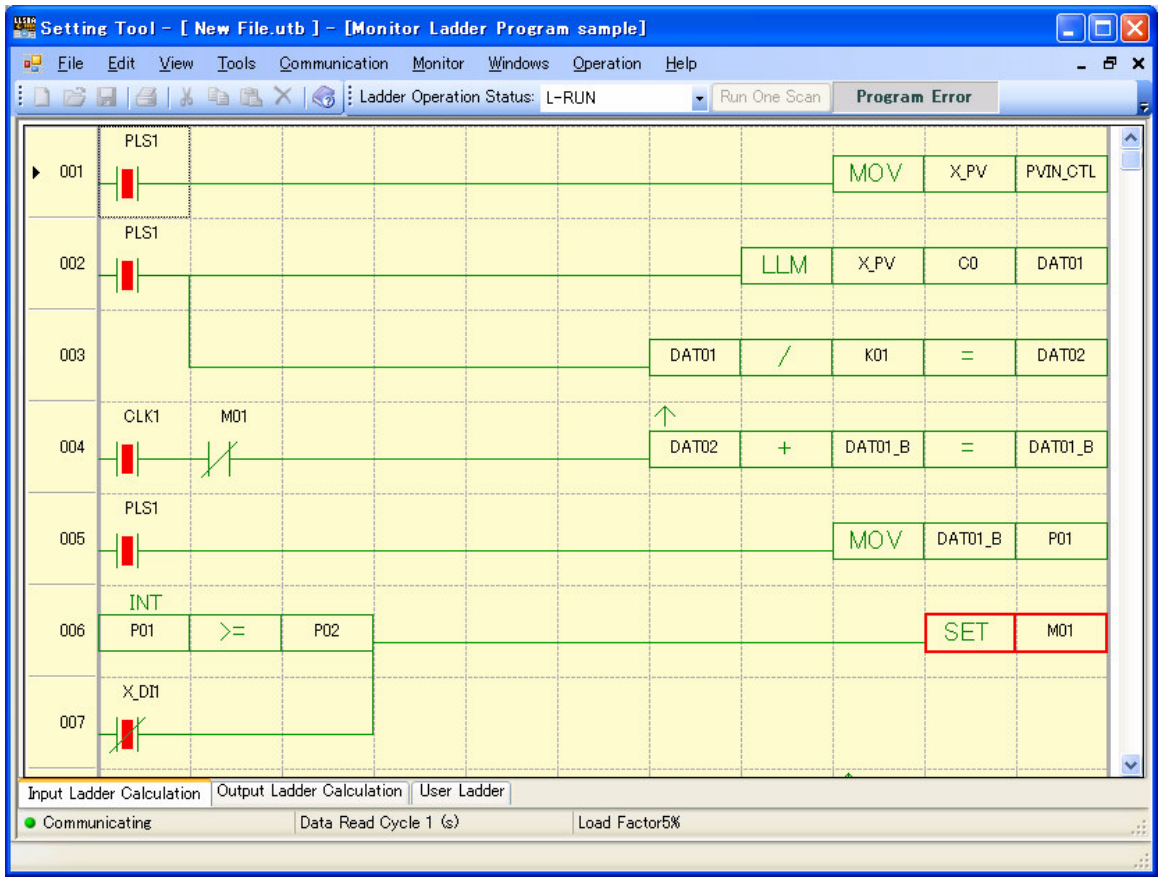
Download the program to UTA35A

- Menu [File]-[Save as] , Save the file to PC with name of "Simple Batch"
- Download the file to UT35A : Menu [Communication] -[Download All]
- Close all windows after downloading
- Menu [Monitor] – [Monitor Ladder Program] to execute ladder program monitoring
- Menu [Monitor] – [Detail View]



Hands-on (1) Operation Check

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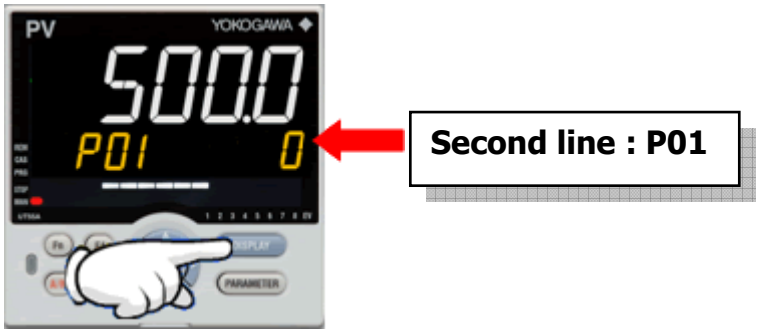
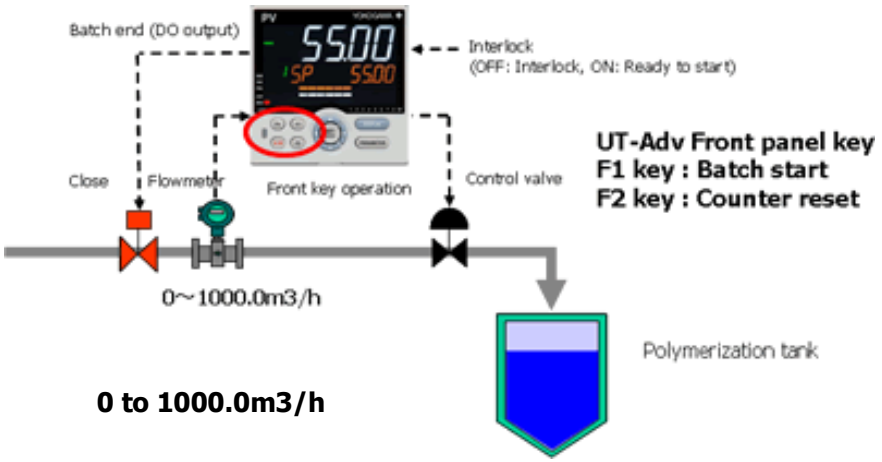
Check operation with ladder program monitor

1. **Press [Display] key several times and display"P01".**
   Then, press [A/M] key to select AUTO (Automatic operation)





2. **SW1(Di1) to ON, Press F1 key and batch control starts.**
   Then, P01 integration counter starts to count.
3. **When flow counter reaches to the batch set point P02[10], the display turns to [BATCH END] and also valve close (D1 lamp lights up) to stop batch.**
4. **Press F2 key to reset P01 counter, then press F1 key to restart batch.**
   And when Di1 turns to OFF, interlock runs to shut-down.

Hands-on (1) Operation - Ladder Programming

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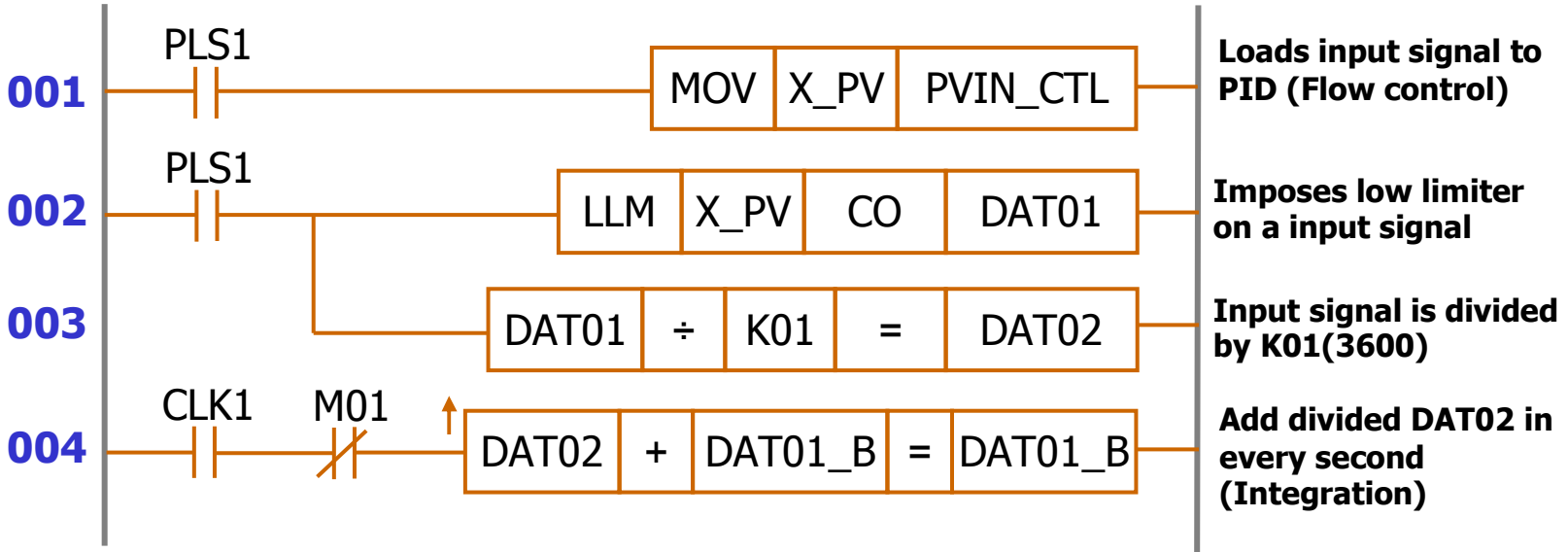

(001) With Always-ON, load X_PV (input signal) to PVIN_CTL (PV in PID control)

(002) With Always-ON, impose low limiter on X_PV data (calculate the value "0" or less as "0" and save in DAT01 (temporary storage register).
LLM is to avoid minus integration in case of IOP etc.

(003) With Always-ON, divide DAT01 by K01(3600), save in DAT02(temporary storage register)
As flow range is 0 -1000.0m3/h. Integration will be done on line 004 in every seconds, instant data to be divided by 3600 (1 hour is 3600 seconds)

(004) With CLK1(1-second clock), accumulate DAT02(divided data) in line 003 on DAT01_B(Integrating counter) in every second.
DAT01_B is holding type and the accumulated data can be saved on power failure.

*"b" contact of M01 is contact input for training simulator only.

Hands-on (1) Operation - Ladder Programming

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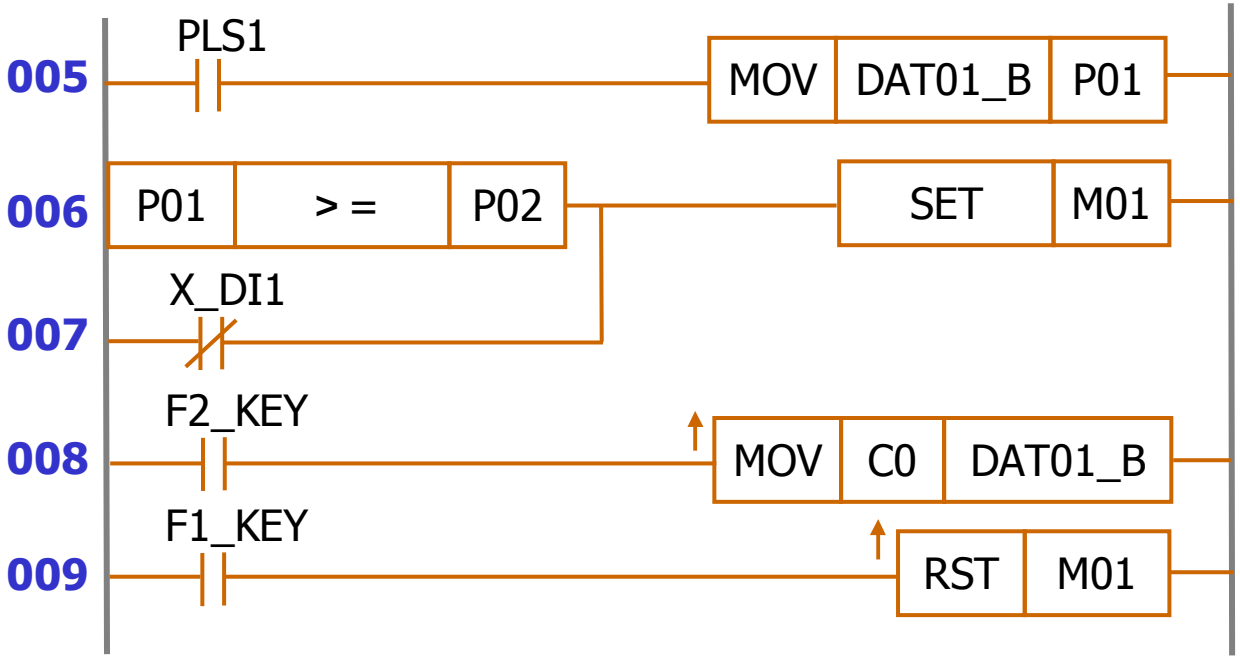

(005) With Always-ON, save DAT01_B(Integration counter) in P01(P register for integrated value display) (*note: 30,000 is maximum for P register)

(006) Set M01 relay (batch end) if P01(Integrated value)>=P02(Batch set point)

*1: Comparison instruction is for integer only. ("10" is shown in case the value is 9.5 or more, and close batch)

* Output operation of M01 relay (batch end) depends on PID setting part. As this is the input ladder program, M01 relay output goes to PID calculation part, not connecting DO terminal.

(007) Even if Di1 is OFF (interlock) in "b" contact, set M01(Batch end)

(008) Press F2 key (integration reset), and C0(0 data) is saved in DAT01_B(integration counter) and integration is reset.

(009) Press F1 key (batch start), then M01 is reset and batch is restarted.