# PETUNJUK SETTING
# LBS JOONGWON, FTU P200
# SERIES

**Load Break Switch Control**
**With FTU-P200**
**Feeder Terminal Unit**
**For Distribution Automation System**

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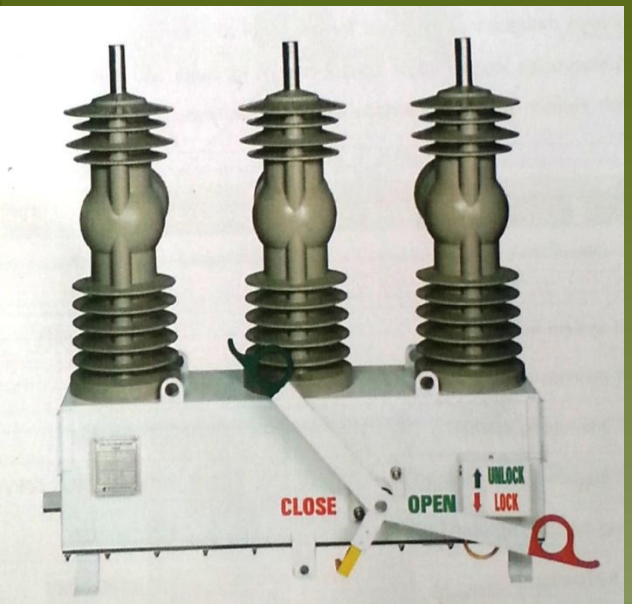
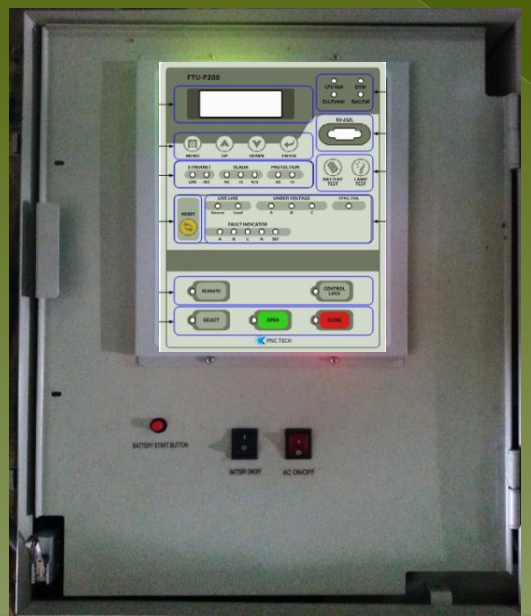
**Daftar Isi:**

1. Panel Antar Muka (User Interface)
2. Indikasi serta Fungsi masing-masing tombol pd Lokal Control Relay
3. Seting Proteksi secara Umum
4. SCADA port dan Protocol Komunikasi
5. Software Interface (Download, Upload dan Resetting)

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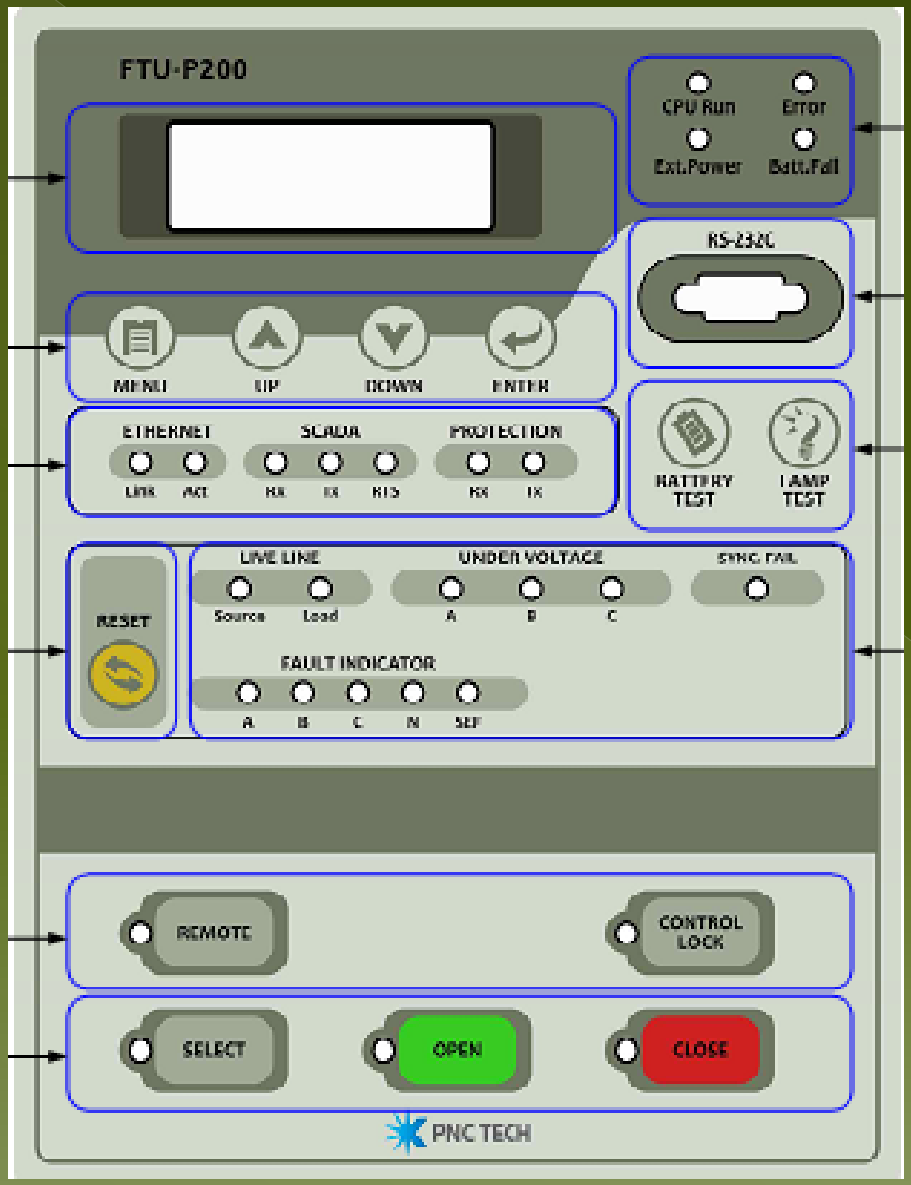
# 1. PANEL ANTAR MUKA (USER INTERFACE)

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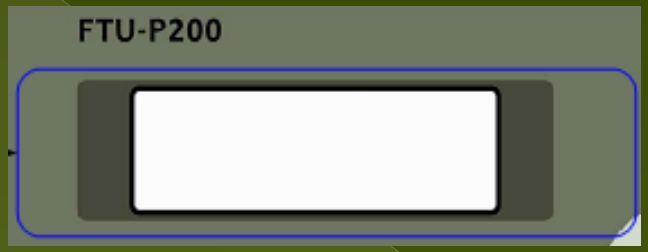
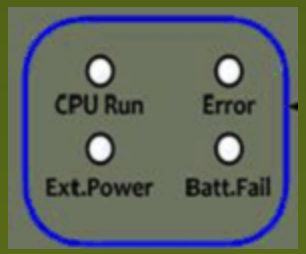
## 2. Indikasi pada Lokal Kontrol




**LCD Display:**
4 Baris x 20 karakter, menampilkan seluruh Format setting dan monitoring dalam bentuk Bahasa dan Numerik

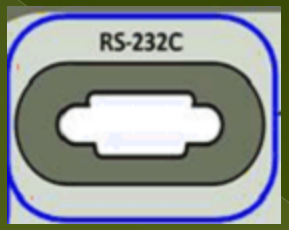



**FTU Status:**

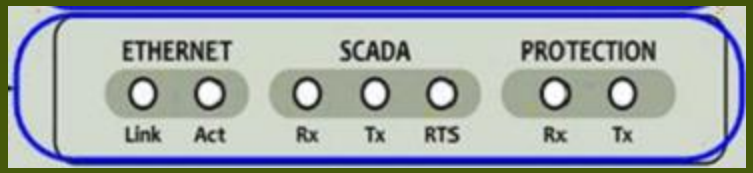
| | |
|---|---|
| CPU Run | : Blinking (CPU OK) |
| Error | : ON saat Terjadi kesalahan dlm Internal System) |
| Ext.Power | : ON ketika Control mendapat Suppy AC 220V |
| Battery Fail | : ON saat Battery Drop Voltage |

**Selector Function:**

| | |
|---|---|
| Menu | : Untuk masuk ke menu utama |
| Up | : untuk memilih menu/sub menu, serta menambah besaran setting |
| Down | : untuk memilih menu/sub menu, serta mengurangi besaran setting |
| Enter | : untuk masuk kemenu/sub menu, pindah Kursor, serta menetapkan besaran nilai setting, dll |




**RS-232 Front Panel Port (DB-9 Female type-Connector)**
Sebagai Port Maintenance Software




**SCADA Status Communication**
**Ethernet**
Link : Ethernet Linking
Act : Ethernet Active

**SCADA**
Rx : Menerima Komunikasi Data
Tx : Mengirim Komunikasi Data
RTS : Meminta Komunikasi Data

**Protection**
Rx : Menerima Komunikasi Data dari FTU Lain
Tx : Mengirim Komunikasi data ke FTU lain

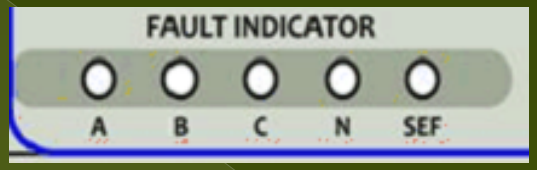
**Battery Test:**
Untuk memeriksa tegangan Battery
**Lamp Test:**
Untuk memonitor kondisi lampu (LED)

**Reset:**
Untuk me-reset/meghilangkan status Indikasi gangguan

**Live Line:**
Source ON: Trdpt tegangan pd sisi sumber
Load ON : Trdapat tegangan pd sisi beban

**Under Voltage:**
ON pada Fasa yg mengalami kondisi Under Voltage (Alarm indication)

**Sync. Fail:**
ON ketika Sisi Sumber dan Beban Tidak Sinkron (Melebihi besarnya nilai setting Perbedaan Sudut derajat serta Lamanya waktu Kejadian)
Interlocking Close Execution, Tie Normaly Open

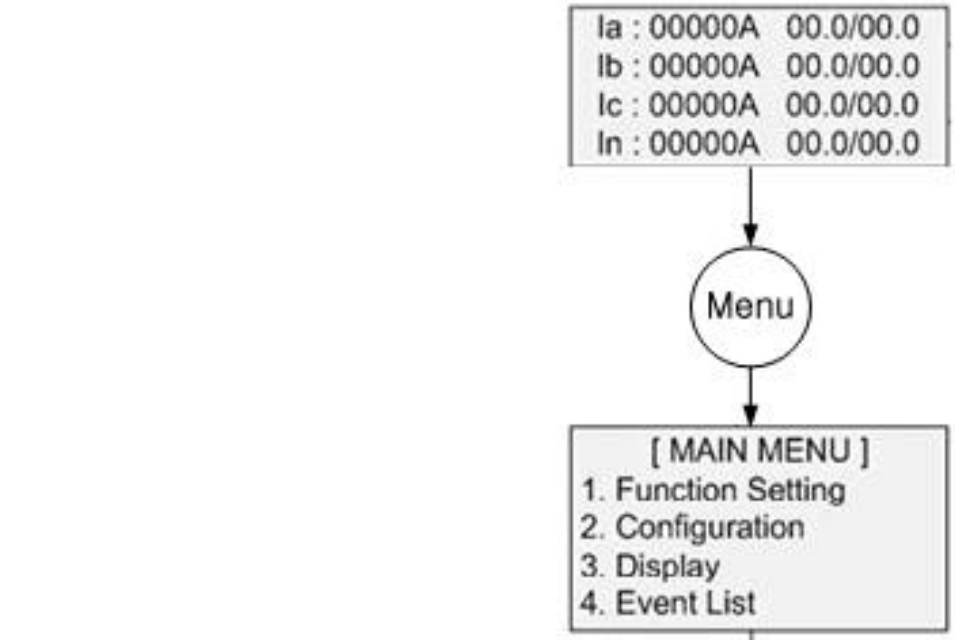



**Fault Indicator:**
A,B,C,N.SEF, akan ON sesuai dengan Fasa yg terganggu

**Remote ON**, Ketika semua Fungsi diambil alih secara Remote (SCADA) untuk men-OFF kan (LOCAL), harus memasukkan Passcode ****
**Control Lock**, Untuk mengunci tombol Operasi dll, juga sebagai pengaman pada saat pemeliharaan

**Select**, tekan Select ON untuk melakukan Fungsi Open/Close secara Lokal serupa dengan konsep SBO (Select Before Operate)
**Open**, Setelah LED Select ON, tekan Open untuk membuka CB
**Close**, Setelah LED Select ON, tekan Close untuk memasukkan CB

# STRUCTURE MENU TREE




| Main Menus | Sub Items |
|---|---|
| **Function Setting** | Group1, Group2, Group3, Group4, Group Setting, Group Copy |
| **Configuration** | I/O, Communication, Event, Time |
| **Display** | Measurements, Status, Counter |
| **Event List** | I/O events, Function events, System events, Fault I events, Demand I events, Demand P events, Demand Q events, Max. I events, Max. P events, Max. Q events |

## 3. PETUNJUK SETTING PROTEKSI

```
[MAIN MENU ]
1.Function Setting
2.Configuration
3.Display
4.Event List
```

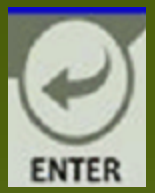
```
[CONFIG MENU ]
1.I/O
2.Communication
3.Event
4.Time
```

Setting waktu

```
[Setting Menu]
1.Group1
2.Group2
3.Group3
4.Group4
5.Group Setting
6.Group Copy
```

GROUP 1 SEBAGAI DEFAULT BANK PROTEKSI

Enter untuk masuk



# Group 1, Setting Indikasi Gangguan PHASA-EF-SEF

| | GROUP 1 : FAULT DETECTION | | | | | |
|---|---|---|---|---|---|---|
| - | **PHASE** | | | | | |
| | Pickup Level | 400 | 10 | 900 | 1 | A |
| | Detection Time | 0.02 | 0.02 | 10.00 | 0.01 | Sec |
| | Coldload Multiplier | 2 | 1 | 10 | 1 | |
| | Coldload Time | 0 | 0 | 180 | 1 | Min |
| | 2nd Harmonic Block | YES | | | | |
| | Function In Use | ON | | | | |
| | Fault Direction | OFF | | | | |
| - | **GROUND** | | | | | |
| | Pickup Level | 60 | 2 | 900 | 1 | A |
| | Detection Time | 0.02 | 0.02 | 10.00 | 0.01 | Sec |
| | Coldload Multiplier | 2 | 1 | 10 | 1 | |
| | Coldload Time | 0 | 0 | 180 | 1 | Min |
| | 2nd Harmonic Block | YES | | | | |
| | Function In Use | ON | | | | |
| | Fault Direction | OFF | | | | |
| - | **SEF** | | | | | |
| | 3Io Pickup | 5.0 | 0.1 | 20.0 | 0.1 | A |
| | -3Vo Pickup | 30 | 0 | 80 | 1 | % |
| | Max. Torque Angle | 90 | 0 | 345 | 15 | DEG |
| | Detection Time | 1.0 | 0.1 | 30.0 | 0.1 | Sec |
| | IoCos Pickup Mode | NO | | | | |
| | Operating Sector Size | 88 | 30 | 90 | 1 | DEG |
| | 2nd Harmonic Block | YES | | | | |
| | Function In Use | OFF | | | | |

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# Fungsi Tambahan Lain

| - | DIRECTION |
|---|---|
| | 3V1 Threshold |
| | 3I1 Threshold |
| | 3I1 Max. Torque Angle |
| | -3Vo Threshold |
| | 3Io Threshold |
| | 3Io Max. Torque Angle |

| | GROUP 1 : SECTIONALIZER | | | | | |
|---|---|---|---|---|---|---|
| | Function In Use | OFF | | | | |
| | Fault Count | 2 | 1 | 3 | 1 | |
| | Reset Time | 30 | 1 | 240 | 1 | Sec |
| | OT Closing | OFF | | | | |
| | OT Source Side | BOTH | | | | |
| | OT Closing Time | 180 | 1 | 600 | 1 | Sec |

| | GROUP 1 : UNDER VOLTAGE |
|---|---|
| | Pickup |
| | Delay Time |
| | Function In Use |
| | **GROUP 1 : OVER VOLTAGE** |
| | Pickup |
| | Delay Time |
| | Function In Use |
| | **GROUP 1 : UNDER FREQUENCY** |
| | Pickup |
| | Delay Time |
| | Function In Use |
| | **GROUP 1 : OVER FREQUENCY** |
| | Pickup |
| | Delay Time |
| | Function In Use |
| | **GROUP 1 : SYNCHRO. CHECK** |
| | Phase Difference |

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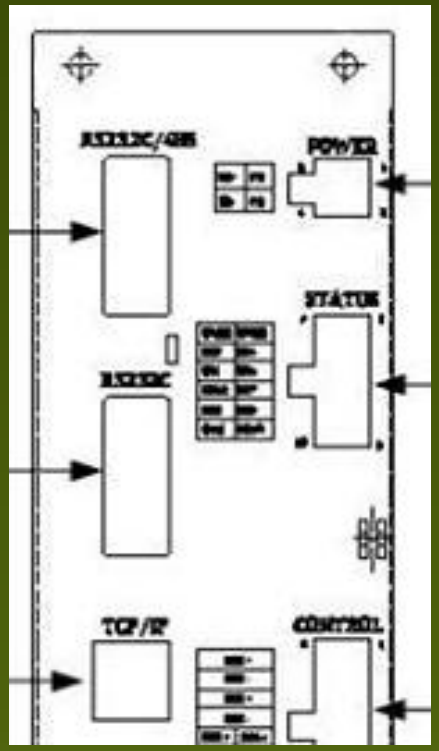
# 4. SCADA dan Port Komunikasi

## Multi Protocol Support

| | | |
|---|---|---|
| Serial Port Speed | 1200/2400/4800/9600/19200 | 9600 |
| Slave Address | 1~65534 | 1 |
| Protocol | DNP or DNPTCP /IEC101/IEC104/MODBUS | DNP or DNPTCP |
| Select Port | RS232C/RS485 | RS232C |

## SCADA Port Position




## SCADA Konfigurasi

| | PORT PARAMETERS | | | | | |
|---|---|---|---|---|---|---|
| - | **SCADA PORT** | | | | | |
| | Serial Port Speed | 9600 | | | | |
| | Slave Address | 1 | 1 | 65534 | 1 | |
| | Protocol | DNP or DNPTCP | | | | |
| | Select Port | RS232C | | | | |
| - | **MODEM CONTROL** | | | | | |
| | Line | FULL-DUFLEX | | | | |
| | RTS Off delay | 50 | 10 | 500 | 5 | ms |
| | CTS Timeout | 2 | 1 | 255 | 1 | Sec |
| | DCD Timeout | 5.0 | 0.1 | 30.0 | 0.1 | Sec |
| | RTS/CTS Control | USED | | | | |
| | CTS to message delay | 0 | 0 | 200 | 5 | ms |
| | Parity (Applicable only to IEC) | EVEN | | | | |
| - | **TCP/IP** | | | | | |
| | IP Address | 0.0.0.0 | | | | |
| | Subnet Mask | 255.255.255.0 | | | | |
| | Gateway | 0.0.0.0 | | | | |
| | DNP Port | 20000 | 0 | 65535 | 1 | |
| | IEC Port | 2404 | 0 | 65535 | 1 | |

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# SCADA Protocol

| DNP3.0 PARAMETERS | | | | | |
|---|---|---|---|---|---|
| D/L Retries | 0 | 0 | 2 | 1 | |
| D/L Timeout | 30 | 1 | 255 | 1 | Sec |
| D/L Confirm | SOMETIMES | | | | |
| A/L Retries | 1 | 0 | 100 | 1 | |
| A/L Timeout | 40 | 1 | 255 | 1 | Sec |
| Unsolicited Mode | OFF | | | | |
| Unsolicited Class 1 Delay Time | 5 | 0 | 60 | 1 | Sec |
| Unsolicited Class 2 Delay Time | 5 | 0 | 60 | 1 | Sec |
| Unsolicited Class 3 Delay Time | 5 | 0 | 60 | 1 | Sec |
| Arm Timeout | 15 | 1 | 255 | 1 | Sec |
| Unsolicited Address | 65531 | 0 | 65531 | 1 | |
| Multi Frame Interval | 100 | 10 | 500 | 10 | ms |
| Analog Event Mode | SOE | | | | |
| Counter Object Size | 16BIT | | | | |
| Unsolicited Offline Retry Delay | 0 | 0 | 255 | 1 | min |
| Unsolicited Class 1 | DISABLE | | | | |
| Unsolicited Class 2 | DISABLE | | | | |
| Unsolicited Class 3 | DISABLE | | | | |

| IEC101 PARAMETERS | | | | | |
|---|---|---|---|---|---|
| Link Address Size | 2 | 0 | 2 | 1 | |
| Common Address Size | 2 | 1 | 2 | 1 | |
| Object Address Size | 2 | 1 | 3 | 1 | |
| COT Size | 1 | 1 | 2 | 1 | |
| Time Marker | CP56 | | | | |
| Single NACK Control | YES | | | | |
| Link Mode | UNBALANCED | | | | |
| **IEC104 PARAMETERS** | | | | | |
| t0 Connection timeout | 30 | 1 | 255 | 1 | Sec |
| t1 Response timeout | 15 | 1 | 255 | 1 | Sec |
| t2 S-Frame Period | 10 | 1 | 255 | 1 | Sec |
| t3 Test Period | 20 | 1 | 255 | 1 | Sec |

| IEC PARAMETERS | | | | | |
|---|---|---|---|---|---|
| Maximum Data Link Frame Size | 261 | 35 | 261 | 1 | |
| C_SE General Interrogation | ENABLE | | | | |
| ASDU Address | 1 | 0 | 65535 | 1 | |
| Analog Value Type | SCALED | | | | |
| Analog Event Mode | SOE | | | | |
| A/L Cyclic Period | 0 | 0 | 60 | 1 | Sec |
| Arm Timeout | 15 | 1 | 255 | 1 | Sec |
| M_SP Cyclic | DISABLE | | | | |
| M_DP Cyclic | DISABLE | | | | |
| M_ME Cyclic | ENABLE | | | | |
| M_SP Start Address | 100 | 1 | 65535 | 1 | |
| C_SC Start Address | 200 | 1 | 65535 | 1 | |
| M_DP Start Address | 300 | 1 | 65535 | 1 | |
| C_DC Start Address | 400 | 1 | 65535 | 1 | |
| M_ME Start Address | 1000 | 1 | 65535 | 1 | |
| C_SE Start Address | 2000 | 1 | 65535 | 1 | |
| M_IT Start Address | 4000 | 1 | 65535 | 1 | |

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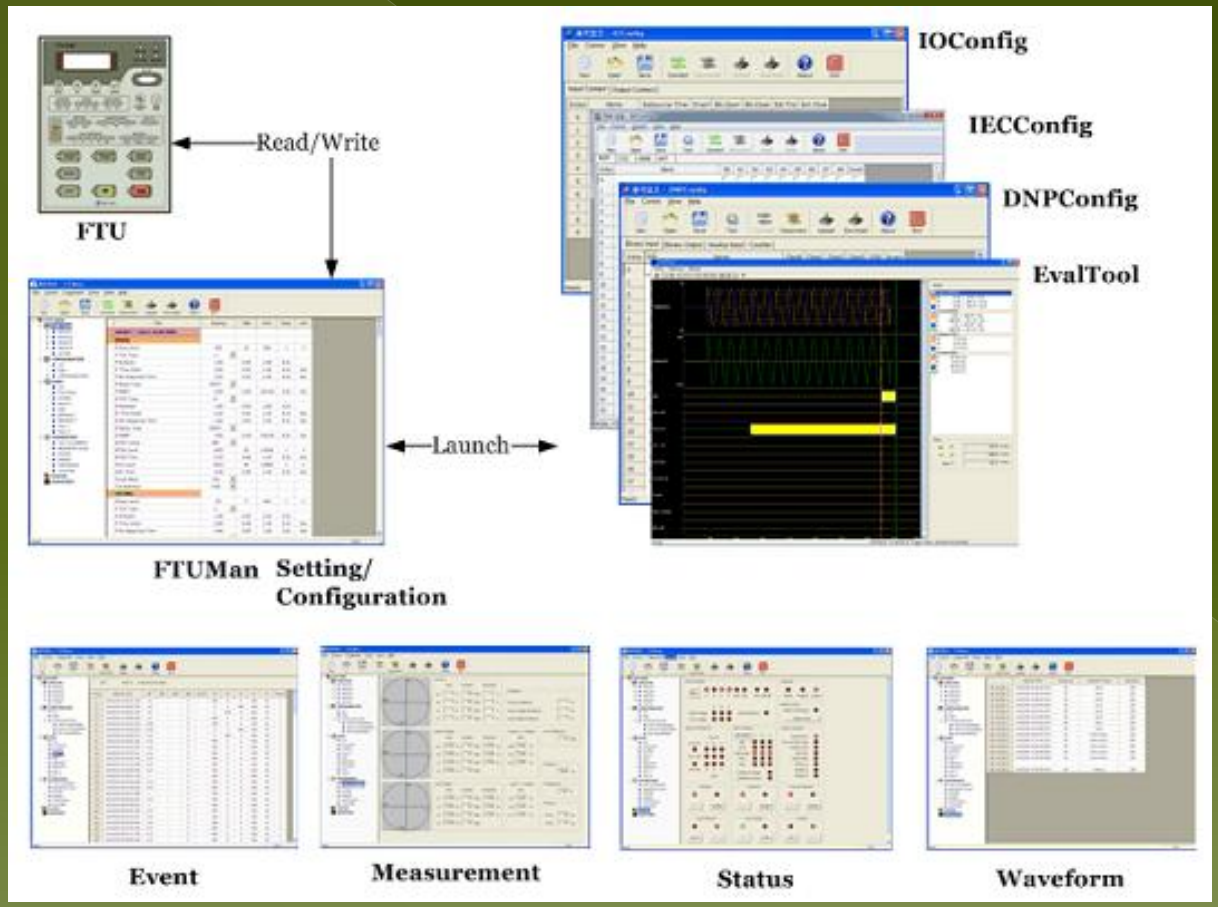
# Feeder Terminal Unit,
# FTU Aplication Interface Software

FTUMan

CustomCurveDlg
DNPConfig
EvalTool
FTUMan
IOConfig

## PNC Management Tools

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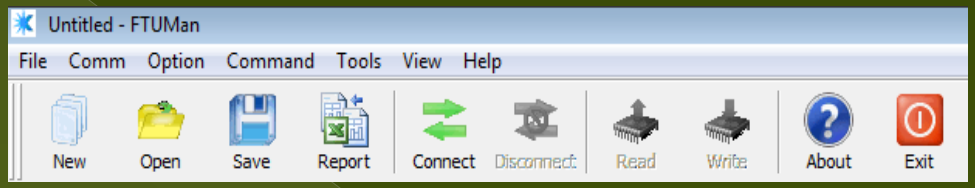
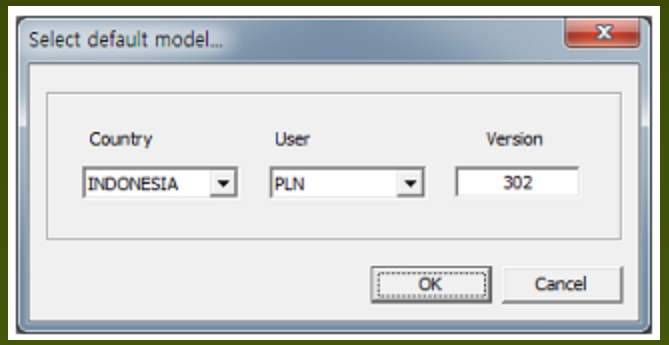
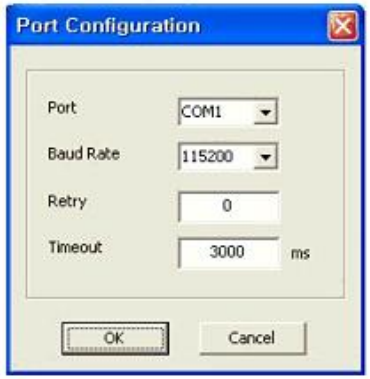
# Memulai Koneksi Software

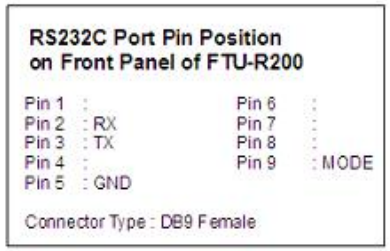



## Option, Select Default Model

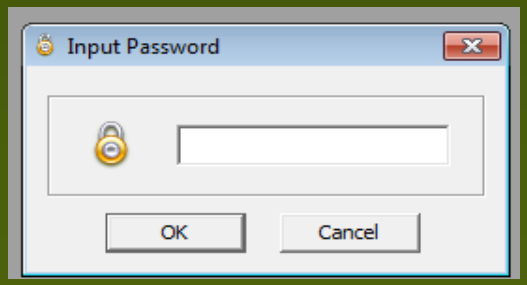



## Comm, Configuration

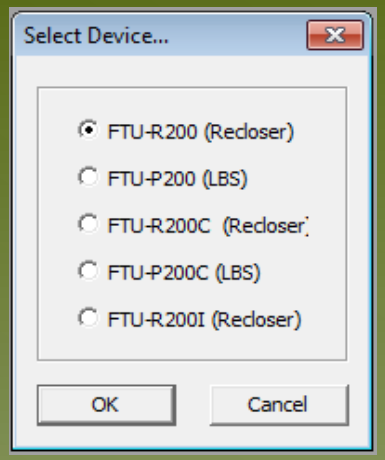


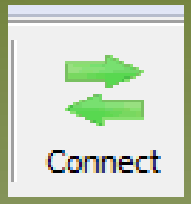

## Option, Change Password




## Option, Select Device




## Connect




## Connected

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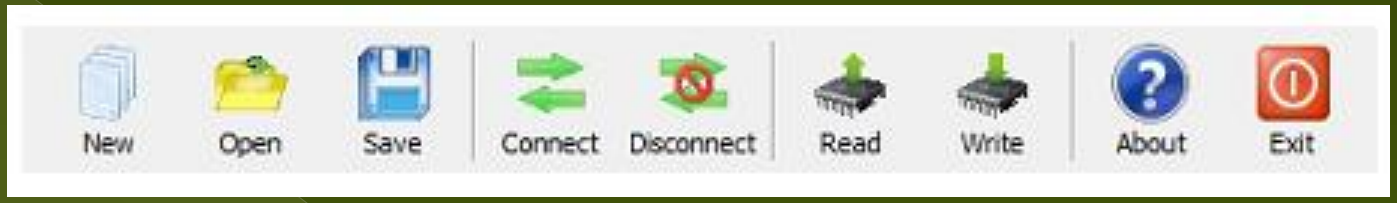
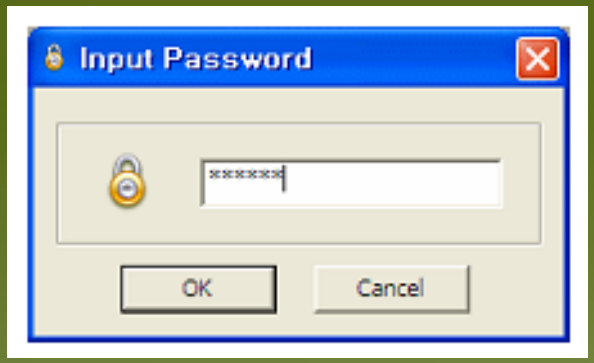
# Langkah Koneksi




| | |
|---|---|
| **Read** | Read data from FTU. |
| **Write** | Write data to FTU. |
| **About** | Opens a window for **FTUMan**'s program version and information. |

# Konfirmasi Write data to FTU




# Monitoring Bar

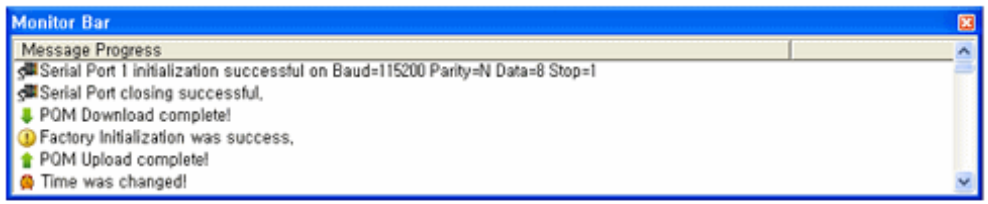
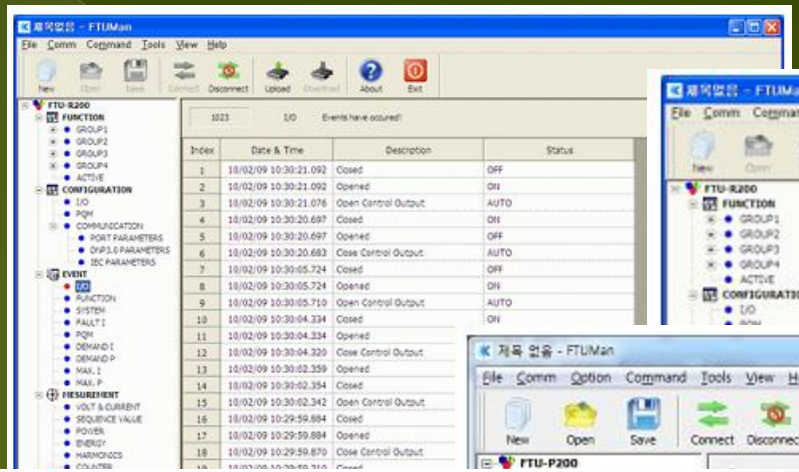
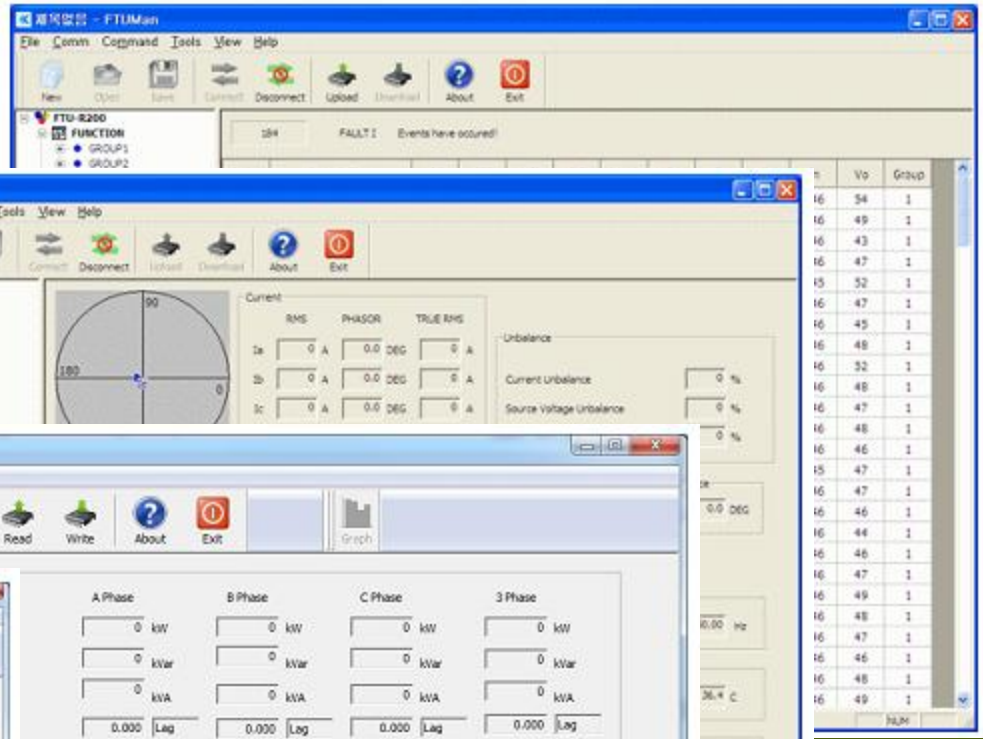


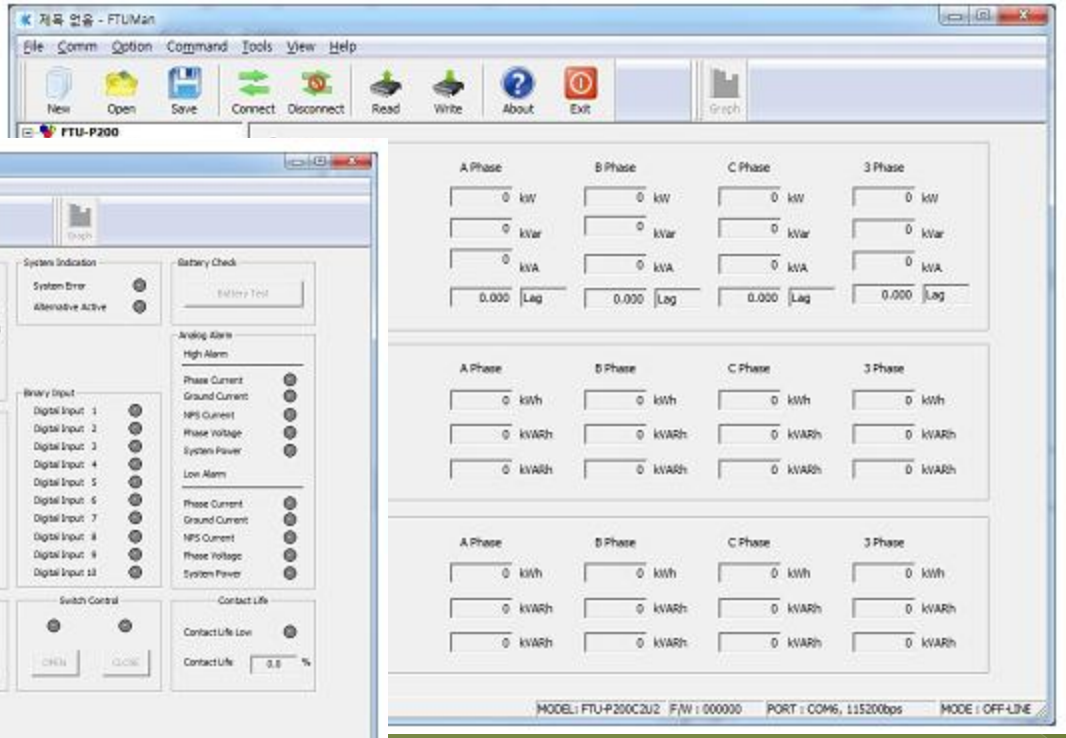

**Figure 9-10 Monitoring Bar**

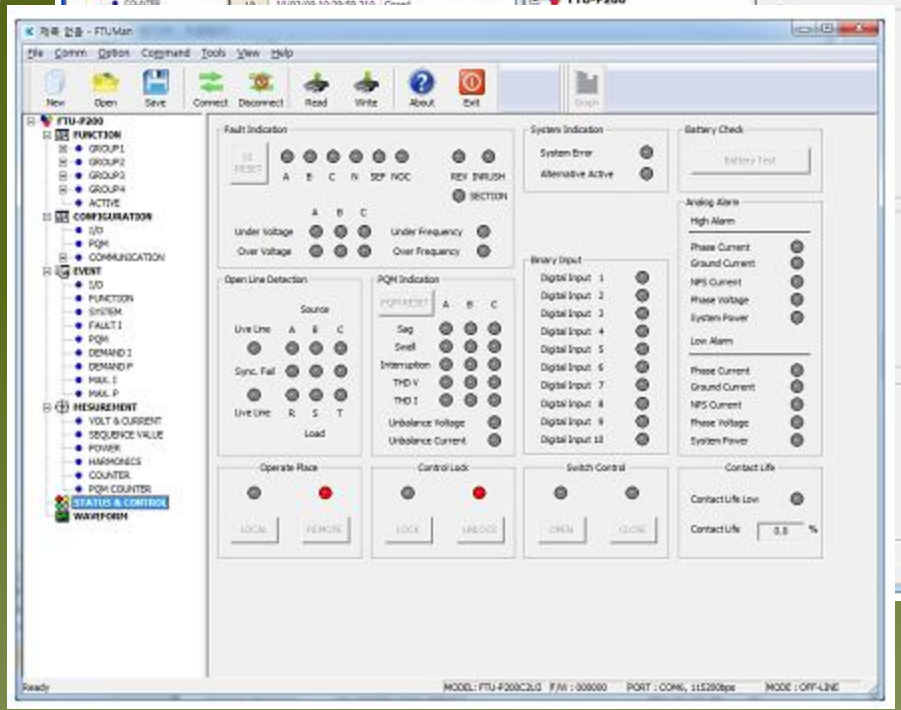
- Some performance is finished
- Reads data from FTU
- Writes the setting value on FTU
- When Factory Initialization occurs.
- Error of connection or operation
- Connect or Disconnect between PC and FTU
- When the time set is completed

# Measurement & Event Data Log

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# Event Recorder Size

| Event List | Sub Items | Max. |
|---|---|---|
| **I/O Events** | Status change of binary Input/Output | 1023 |
| **Function Events** | Operated status of Protection Function | 30000 |
| **System Events** | Setting change, Reset, Self Diagnosis | 255 |
| **Fault I Events** | Latest fault current, phase and time | 255 |
| **PQM Events** | Operated status of PQM Function | 255 |
| **Demand I,P,Q Events** | Each phase daily average load current, active power and reactive power with time | 6143 |
| **Max. I,P,Q Events** | Each phase daily Peak load current, active power and reactive power with time | 1023 |

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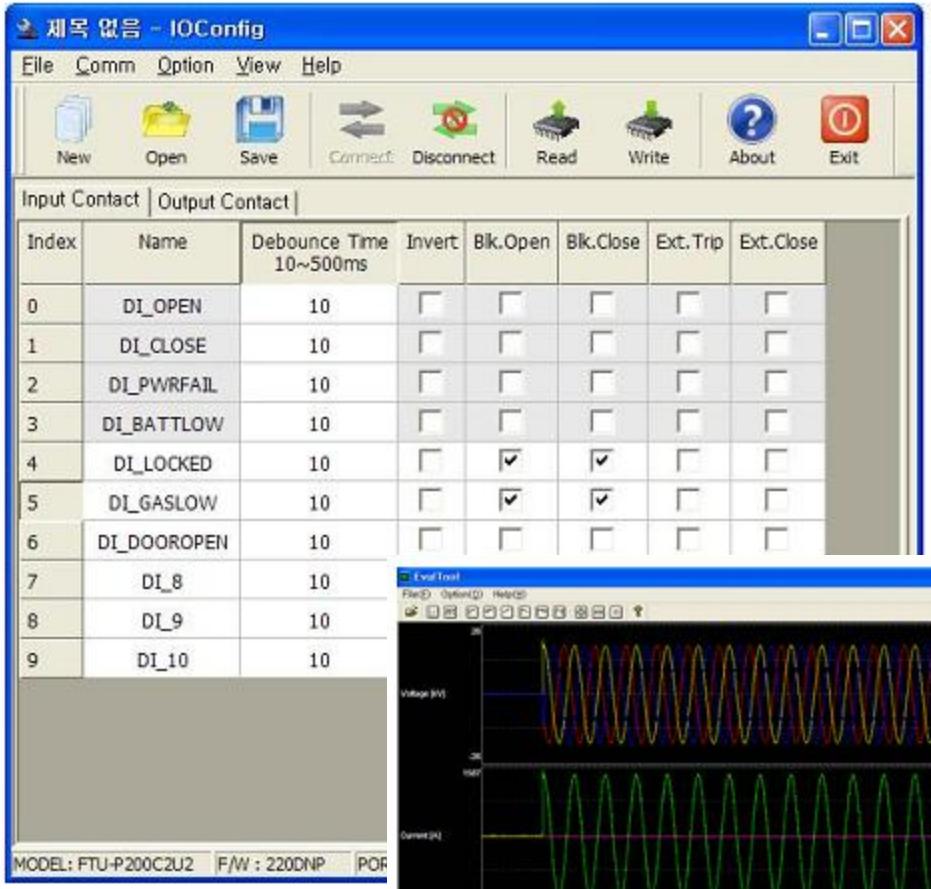
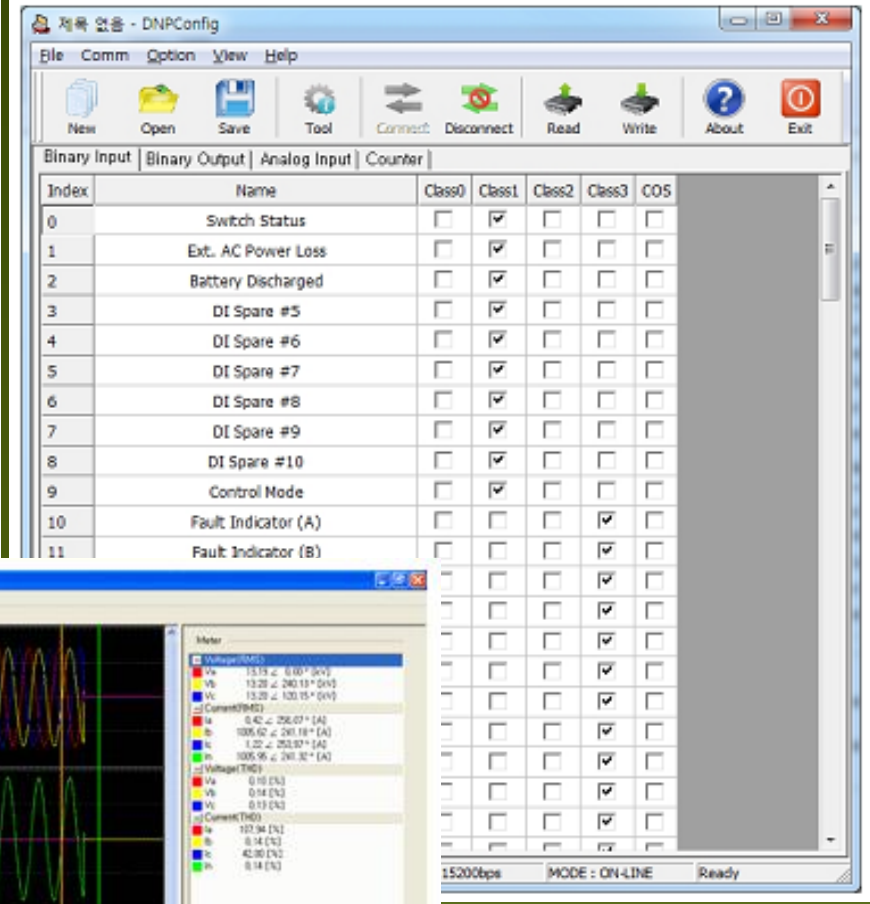
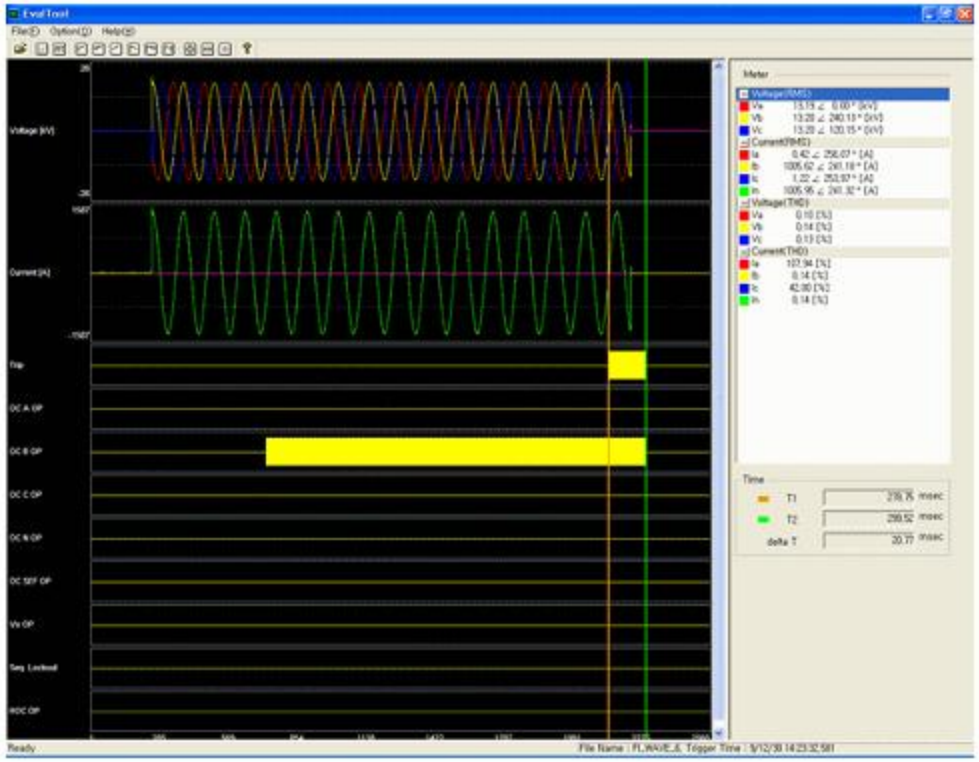
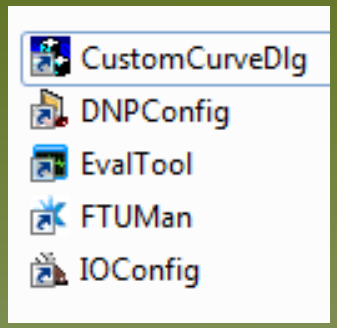
# IO Config, DNP Config, Eval Tool




PNC Technologies

JOONGWON Co., Ltd.

# SEKIAN DAN TERIMAKASIH

PNC Technologies

JOONGWON Co., Ltd.

Feeder Terminal Unit

*for Distribution Automation*

*Auto Recloser Control*

*Model Name : FTU-R200*

**Dipresentasikan Oleh:**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