PETUNJUK SETTING

RECLOSER JOONGWON, FTU R200 SERIES

Auto Recloser Control
With FTU-R200
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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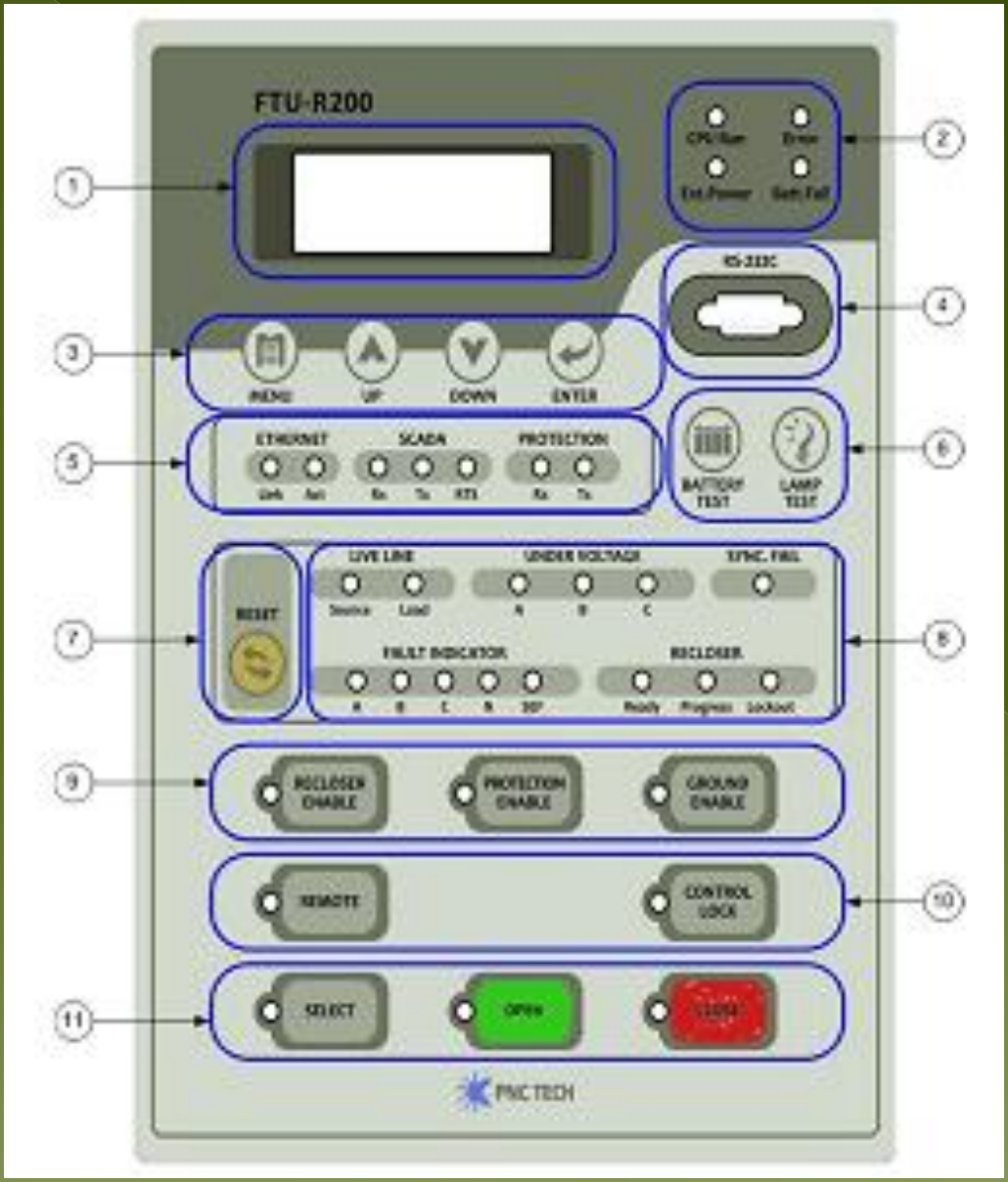
1. PANEL ANTAR MUKA (USER INTERFACE)



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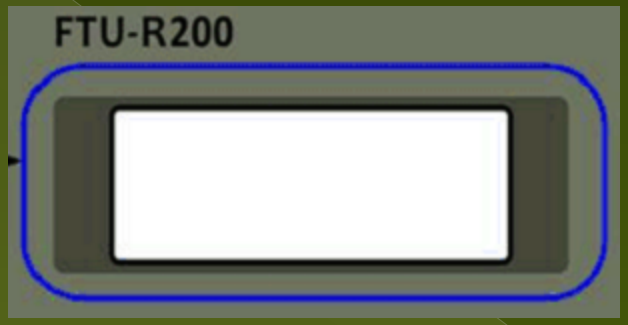
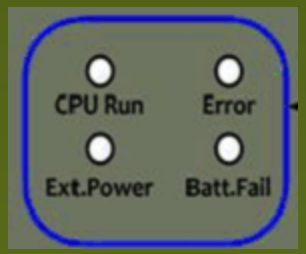
2. Indikasi pada Lokal Kontrol



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

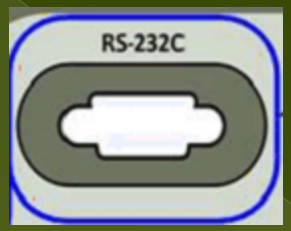


FTU Status:

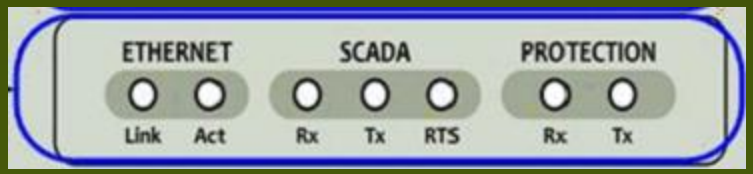
CPU Run	: Blinking (CPU OK)
Error	: ON saat Terjadi kesalahan dlm Internal System)
Ext.Power	: ON ketika Control mendapat Suppy AC 220V
Battery Fail	: ON saat Battery Drop Voltage

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 (Trip or 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

Sequence Status Recloser:

Ready	: Kondisi Close dan Siap untuk mengambil gangguan
Progress	: Auto Reclose aktif, sesuai dengan Interval waktu setting
Lockout	: Recloser Open mengunci, Gangguan bersifat Permanen

Reclose Enable ON, Fungsi AutoReclose Aktif
Protection Enable ON, Fungsi Proteksi Aktif
Ground Enable ON, Fungsi Proteksi EF (*Earth Fault*) aktif

Remote ON, Ketika semua Fungsi diambil alih secara Remote (SCADA) untuk men-OFF kan (LOCAL), harus memasukkan Passcode ****

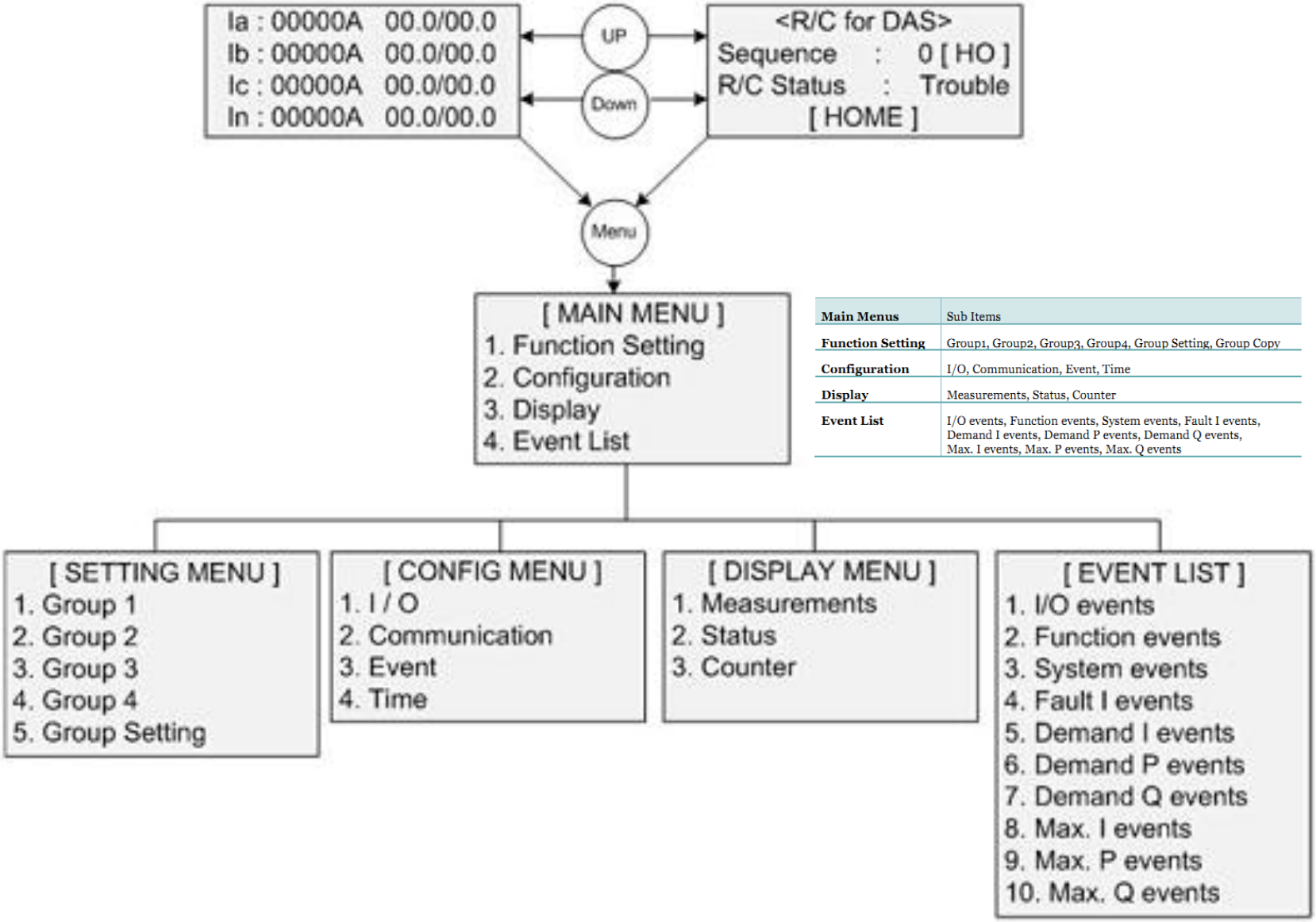
Control Lock, Untuk mengunci tombol Operasi dll, juga sebagai pengaman pada saat pemeliharaan

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
```

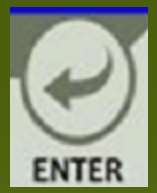
Setting waktu

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

```
[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 Gangguan PHASA (OCR/DTOC/HCT)

I> Pickup
I>dt Pickup
I>> HC

GROUP 1 : FAULT DETECTION					
PHASE					
Pickup Level	10	1	1600	1	A
F TCC Type	A				
F Multiplier	1.00	0.05	2.00	0.01	
F Time Adder	0.00	0.00	1.00	0.01	Sec
F Min Response Time	0.00	0.00	1.00	0.01	Sec
F Reset Type	RDMT				
F RDMT	0.00	0.00	10.00	0.01	Sec
D TCC Type	B				
D Multiplier	1.00	0.05	2.00	0.01	
D Time Adder	0.00	0.00	1.00	0.01	Sec
D Min Response Time	0.00	0.00	1.00	0.01	Sec
D Reset Type	RDMT				
D RDMT	0.00	0.00	10.00	0.01	Sec
DTOC Active	OFF ON				
DTOC Level	1000	50	10000	1	A
DTOC Time	0.00 ★	0.00	1.00	0.01	Sec
HOC Level	500	100	1500	1	%
HOC Time	0.00 ★	0.00	1.00	0.01	Sec
Cold Load Multiplier	2	1	10	1	
Cold Load Time	0	0	180	1	Min
Inrush Multiplier	2	1	10	1	
Cold Load Multiplier	2	1	10	1	
Cold Load Time	0	0	180	1	Min
Inrush Multiplier	2	1	10	1	
Inrush Time	0.20	0.00	30.00	0.01	Sec
2nd Harmonic Block	YES				
Fault Trip Direction	NONE				

Curve Type	Curve Name
Recloser Curves	A,A*,B,C,D,E,F,G,H,J,KP,KG,L,M,N,P,R,T,V,W,Y,Z, 1,2,3,4,5,6,7,8,8*,8+,9,11,13,14,15,16,17,18
IEC Standard Curve	Standard Inverse(NI),Very Inverse(VI),Extremely Inverse(EI) Long-time Inverse(LI),Short-time Inverse(SI)
ANSI/IEEE Standard Curve	Moderately Inverse(IM),Very Inverse(IV),Extremely Inverse(IE), Long-time Inverse(U8),Short-time Inverse(U2)
KEPCO Standard Curve	N1,N2,N3,N4
User Customized Curve	C1,C2,C3,C4

58 Curve

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Group 1, Setting Gangguan GROUND (EF/SEF/DTOC/HCT)

GROUND					
Pickup Level	60	2	1600	1	A
F TCC Type	1				
F Multiplier	1.00	0.05	2.00	0.01	
F Time Adder	0.00	0.00	1.00	0.01	Sec
F Min Response Time	0.00	0.00	1.00	0.01	Sec
F Reset Type	RDMT				
F RDMT	0.00	0.00	10.00	0.01	Sec
D TCC Type	2				
D Multiplier	1.00	0.05	2.00	0.01	
D Time Adder	0.00	0.00	1.00	0.01	Sec
D Min Response Time	0.00	0.00	1.00	0.01	Sec
D Reset Type	RDMT				
D RDMT	0.00	0.00	10.00	0.01	Sec
DTOC Active	OFF ON				
DTOC Level	1000	50	10000	1	A
DTOC Time	0.00 ★	0.00	1.00	0.01	Sec
HOC Level	1500	100	1500	1	%
HOC Time	0.00 ★	0.00	1.00	0.01	Sec
Cold Load Multiplier	2	1	10	1	
Cold Load Time	0	0	180	1	Min
Inrush Multiplier	2	1	10	1	
Inrush Time	0.20	0.00	30.00	0.01	Sec
2nd Harmonic Block	YES				
Fault Trip Direction	NONE				
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
Reset Time	0.00	0.00	10.00	0.01	Sec
IoCos Pickup Mode	NO				
2nd Harmonic Block					

Curve Type	Curve Name
Recloser Curves	A,A*,B,C,D,E,F,G,H,J,KP,KG,L,M,N,P,R,T,V,W,Y,Z, 1,2,3,4,5,6,7,8,8*,8+,9,11,13,14,15,16,17,18
IEC Standard Curve	Standard Inverse(NI),Very Inverse(VI),Extremely Inverse(EI) Long-time Inverse(LI),Short-time Inverse(SI)
ANSI/IEEE Standard Curve	Moderately Inverse(IM),Very Inverse(IV),Extremely Inverse(IE), Long-time Inverse(U8),Short-time Inverse(U2)
KEPCO Standard Curve	N1,N2,N3,N4
User Customized Curve	C1,C2,C3,C4

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Auto Reclose Function

	GROUP 1 : TRIP & RECLOSING					
-	**PHASE/GROUND**					
	Phase Operation Count	4	1	5	1	
	Ground Operation Count	4	1	5	1	
	Phase Fast Count	2	0	5	1	
	Ground Fast Count	2	0	5	1	
	Phase HCT Operation Count	0	0	5	1	
	Ground HCT Operation Count	0	0	5	1	
	Dead Time 1st	0.6	0.5	1000.0	0.1	Sec
	Dead Time 2nd	2	1	1000	1	Sec
	Dead Time 3rd	15	1	1000	1	Sec
	Dead Time 4th	15	1	1000	1	Sec
	Reset Time	30	2	300	1	Sec
-	**SEF**					
	SEF Operation Count	4	1	5	1	
	Dead Time 1st	0.6	0.5	1000.0	0.1	Sec
	Dead Time 2nd	2	1	1000	1	Sec
	Dead Time 3rd	15	1	1000	1	Sec

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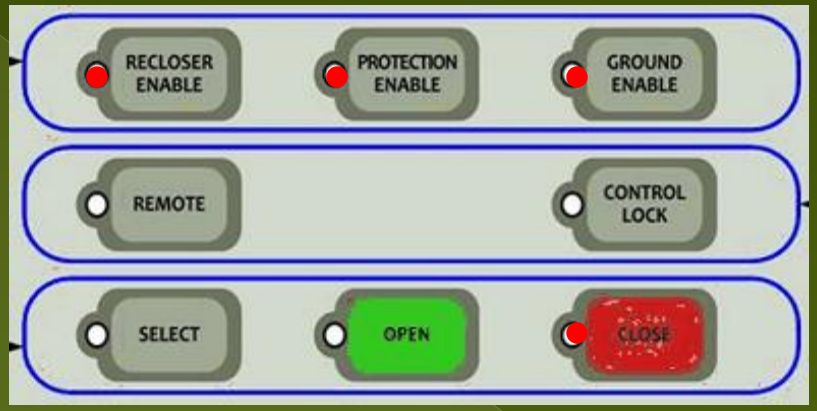
Jangan Lupa!!!,, Aktifkan Fungsi Proteksi pada Lokal ontrol setelah melakukan Setting



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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 : 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

-	SINGLE SHOT TIME
	Time
-	**SEQ. COORDINATION**
	Active
	GROUP 1 : LOOP SCHEME
	Section Function
	Open Time
	OT Closing
	OT Source Side
	OT Closing Time

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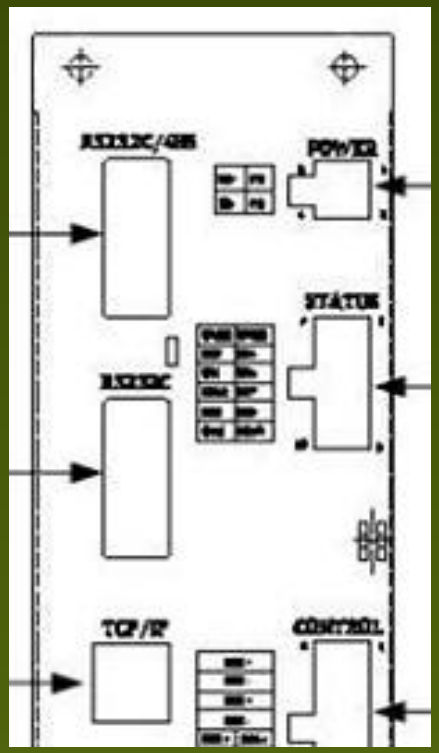
4. SCADA dan Port Komunikasi

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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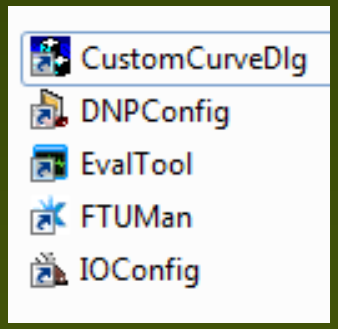
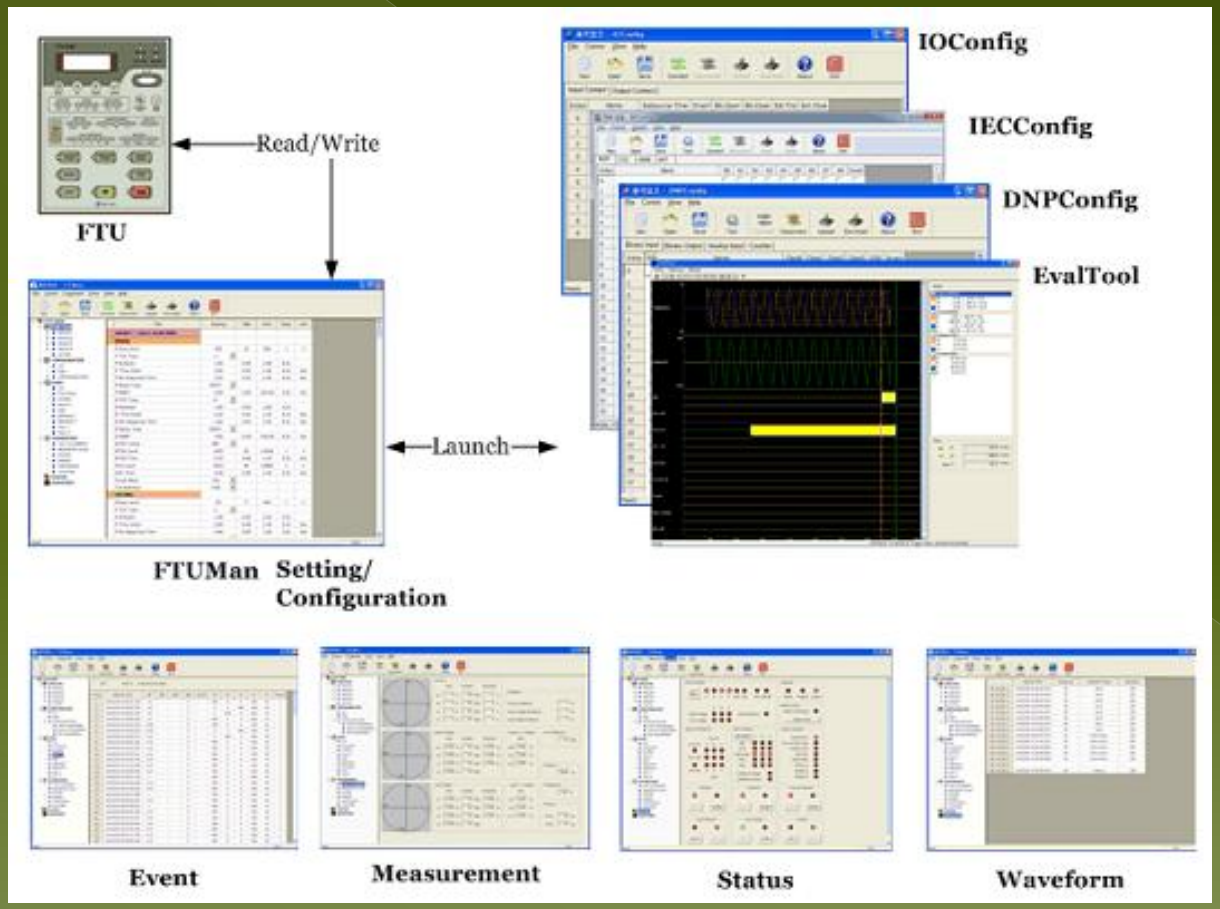
Feeder Terminal Unit,
FTU Aplication Interface Software

PNC Management Tools





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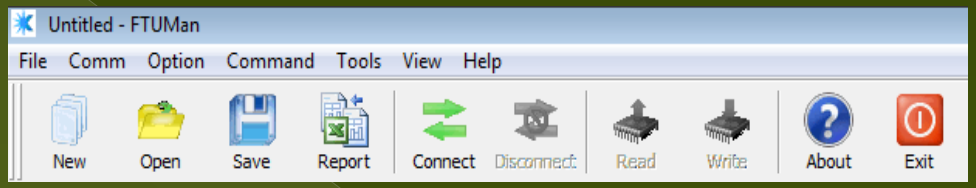
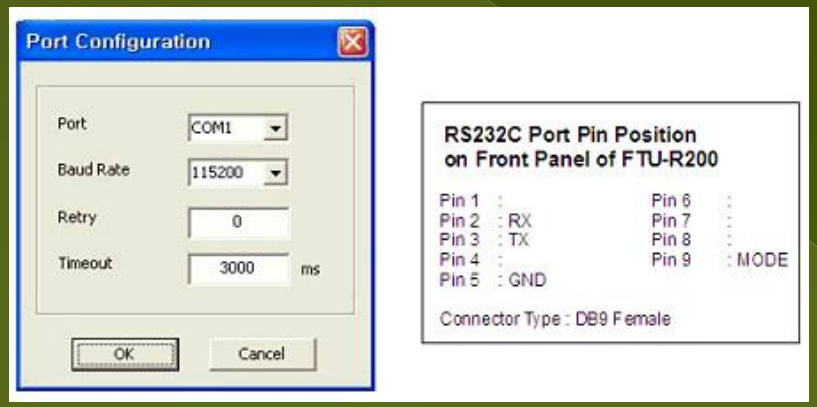
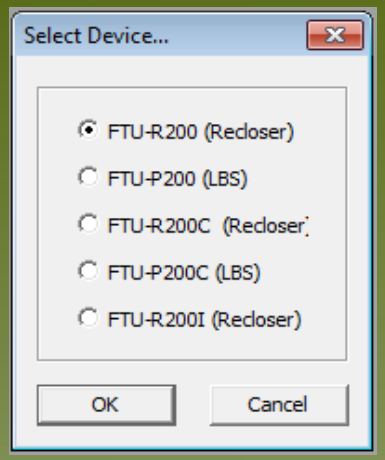
Memulai Koneksi Software



Comm, Configuration



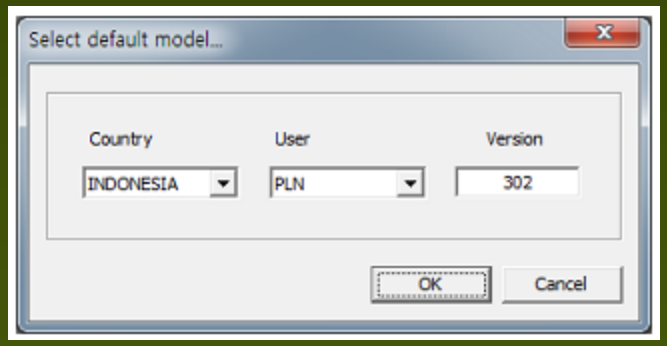
Option, Select Device



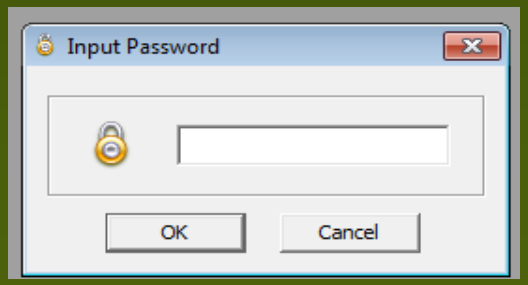
Connect

Connected

Option, Select Default Model



Option, Change Password



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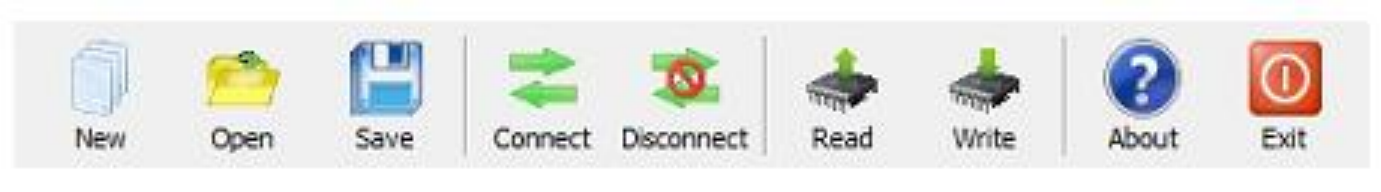
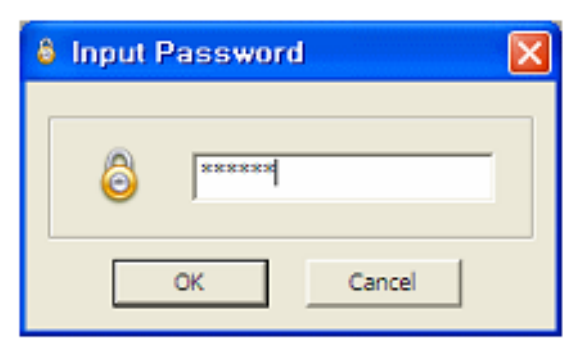
Langkah Koneksi



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

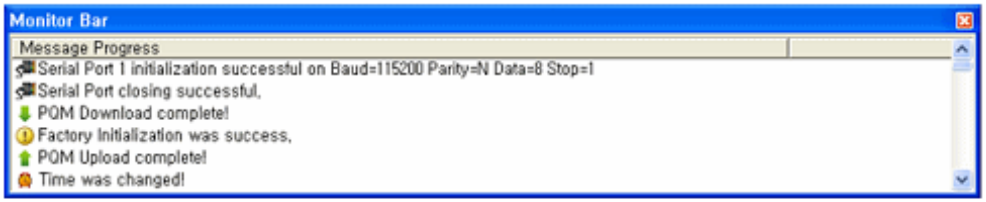
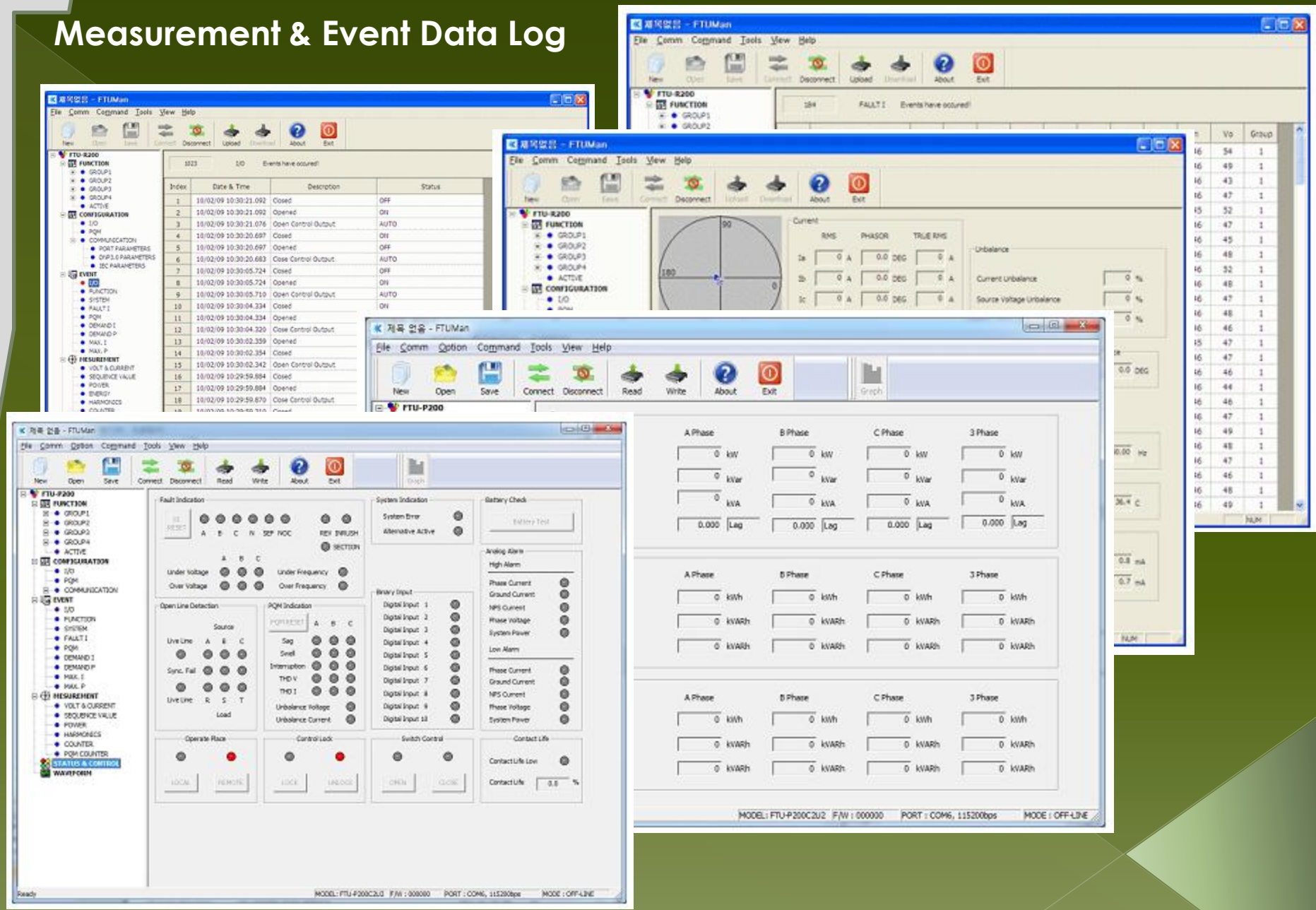


Figure 9-10 Monitoring Bar

- 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

제목 없음 - IOConfig

File Comm Option View Help

New Open Save Connect Disconnect Read Write About Exit

Input Contact | Output Contact

Index	Name	Debounce Time 10~500ms	Invert	Blk.Open	Blk.Close	Ext.Trip	Ext.Close
0	DI_OPEN	10					
1	DI_CLOSE	10					
2	DI_PWRFAIL	10					
3	DI_BATTLOW	10					
4	DI_LOCKED	10		✓	✓		
5	DI_GASLOW	10		✓	✓		
6	DI_DOOROPEN	10					
7	DI_8	10					
8	DI_9	10					
9	DI_10	10					

MODEL: FTU-P200C2U2 F/W : 220DNP POR

제목 없음 - DNPConfig

File Comm Option View Help

New Open Save Tool Connect Disconnect Read Write About Exit

Binary Input | Binary Output | Analog Input | Counter

Index	Name	Class0	Class1	Class2	Class3	COS
0	Switch Status		✓			
1	Ext. AC Power Loss		✓			
2	Battery Discharged		✓			
3	DI Spare #5		✓			
4	DI Spare #6		✓			
5	DI Spare #7		✓			
6	DI Spare #8		✓			
7	DI Spare #9		✓			
8	DI Spare #10		✓			
9	Control Mode		✓			
10	Fault Indicator (A)				✓	
11	Fault Indicator (B)				✓	

15200bps MODE : ON-LINE Ready

EvalTool

Meter

Time

- CustomCurveDlg
- DNPConfig
- EvalTool
- FTUMan
- IOConfig

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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