FTU (Feeder Terminal Unit)
for Distribution Automation

FTU-P200
Pole-mounted Load Break Switch Control

FTU-R200
Automatic Circuit Recloser Control
Our high technology doesn’t allow even 1% tolerance of error.

P&C Technologies is a company that creates an increasingly convenient world as it is a group of technology specialists who pursue innovations for human comfort and who are geared towards service maintenance, upholding clients and proven safety through impeccable verification and testing, and creating reliable state-of-the-art digital technological powers.

Our system and products guarantee the superiority of P&C Technologies.

P&C Technologies, equipped with outstanding personnel and an impeccable quality system, is growing rapidly in an intensive period of time by supplying FTU, Numerical protection relay and substation mRTUs to the KEPCO.
Contents

04 Introduction, Key Features / 05 Features / 07 Technical Data / 10 General Specifications
11 Communication Interface / 12 Outline & Dimension, Enclosure Dimensional Drawings
13 FTU Interface Connectors, Construction / 14 External Connections
15 Various types of Device for Distribution Automation
FTU-200 series

Introduction

FTU is a remote terminal unit for distribution automation which controls and monitors switches on the distribution lines such as Load Break Switch, Recloser, or RMU (Ring Main Units) and measures various electrical quantities of the line and transmits data to control center through remote communication.

FTU-200 series are the advanced terminal units which were upgraded from FTU-100 series equipped with more functions and multiple protocols support and enhanced hardware platform.

Key Features

- Integrated multi-functions on new microprocessor based platform - Fault detection & Protection, Metering, Control, Status monitoring, Power quality monitoring.
- Directional protection, Negative sequence protection, SEF and lots of built-in over-current protection curves including IEC, ANSI/IEEE, Recloser curves and customized curves.
- 4 setting groups and automatic setting group change function.
- 4 quadrants energy metering & load profiling.
- Multi-port, multi-protocol communication support (DNP3.0, DNP3.0 over TCP/IP, IEC60870-5-101/104), modem control & dial-up function for SCADA.
- DNP3.0 subset level 3 with information index mapping & class assignment.
- Built-in protocol monitor for integrating FTU with DAS system.
- Large size memory for load profiling, event and fault recording. Available Disturbance waveforms with COMTRADE format.
- Configurable digital inputs and outputs.
- Intelligent power supply & battery charger with built-in self-diagnosis & test function.
- Easy maintenance through separated module design with simple CAN interface.
- IP54 enclosure for mounting on the pole-top
- Type tested in accordance with IEC60265-1 and IEEE Std. C37.60
- Customized supports for special user-required functions and firmware upgradable at site.
Features

Hardware

RTU
- Dual Processor: ARM9 (96MHz) + DSP (TMS320C6713)
- 16-bit A/D converter
- Non-volatile memory: FRAM (1 Mbyte), Flash ROM (2 Mbytes)
- HMI: LCD 20 characters * 4 lines with LED backlight, Buttons, LEDs
- 10 Contact inputs, 4/6 Digital Outputs (Electrical isolation): Configurable
- 2 channel 4-20mA TD inputs
- RS232C, ETHERNET, RS232C/RS485

Controller
- Battery charger with test circuit
- Power supply for FTU and modem
- LBS Motor driving
- CAN interface

Control box
- Step down transformer (AC220V/30V)
- Lead acid battery (12V*2, 35Ah, 18Ah-Standard)
- Modern space
- IP54

Main functions

Metering
- 128 Samples per cycle
- Galvanic isolation through Aux. CT & Aux. PT
- Secondary of 1000:1 CT ~ 12.5A, Up to 200% of rated voltage
- Power: Apparent(kVA), Active(kW), Reactivel(kVar), Power factor
- Energy: 4-quadrant metering, import / export active energy, inductive / capacitive reactive energy.
- Frequency
- Demand Profile
- Report value by deadband

Status monitoring
- 10 Contacts input: Open, Closed, Lock, Gas low, Door open, etc.
  - Opto-isolation
  - Delay timers for de-bouncing of each contact input
  - Configurable: Name, Interlock condition, Inverted status
- Controller status (battery & battery charger test result)
  - External AC power loss
  - Battery low, Battery Fail, Battery overvoltage, Battery Charger Fail, Grounded battery
  - Battery voltage
- Control Status
  - Operator place: Local/Remote
  - Control Lock
  - Recloser On/Off, Protection On/Off, Ground Protection On/Off Function Status
  - Fault indicators, PMU status, Load Line (source, load side), Phase sync., Reclosing status
  - Under voltage status, Under frequency status, Self-diagnostics status, etc.
  - Analog Hi/Low alarm

Control
- 4 contacts output, 2 high-speed outputs
  - Open(Trip), Close, Spares
  - Configurable: Name, Pulse width
FTU-200 series

- Switch Control
  - Operator place: Remote, Local (Front Panel/PC Tool)
  - Interlocks: Control Lock, Gas low, Mechanical Lock, Current Switch status
  - Close interlock conditions (Selective): Live load, Phase sync. fail
- SBO (Select before Operate)
  - Secure switch operation
  - SBO timeout (settable)
- Auto reclosing
  - Recloser On/Off
  - Protection On/Off
  - Ground protection On/Off
- Battery Test, Reset Indicators

Protection
- Fault passage indicator
- 3-stage over current protection (directional or non-directional)
- Fast and delayed TC trip elements for phase and earth fault
- 54 types of built-in TC Curves (IEC, ANSI, Recloser curves) and 4 Customized TC Curves
- Definite time over-current element
- Definite time HCT (High Current Trip)
- Negative sequence over-current protection
- SEF (Sensitive earth fault) detection
- Cold load protection (pickup adjustment)
- Magnetizing inrush restraints
- Sequence coordination
- Open line detection
- Phase sync. fail detection
- Over voltage, under voltage, under/over frequency
- Auto reclosing (up to 4 shots)
- Auto sectionalizing
- 4 setting groups, automatic setting group change depending on power flow

Power quality monitoring
- Sag, Swell, Interruption Detection
  - Status
  - Events: Time-stamp, Magnitude, Duration
  - Counters: Statistics for each phase, duration classified by IEEE 1159.
  - Accumulated interruption time
  - Waveform recording on events
- Harmonics
  - THD (Total harmonic distortion)
  - Each components up to 31th harmonics
  - Events by threshold setting, Counter

Event/Fault Recording
- SOEs are stored on non-volatile memory with 1ms time-stamp
- Event history buffers are categorized by group
  - I/O Events, Function Events, System Events
  - Fault current Events
  - PQM Events
  - Demand I,P,Q
  - Daily Max. I,P,Q
  - Counter: Switch open, Fault, Restart
  - Memory size: 1Mbytes
- Fault waveform recording
  - 8 faults, 6 PQM waveforms can be stored on non-volatile memory
  - 1 Manual triggered waveform
  - 128 samples/cycle, 20 cycles
  - Waveforms are stored as COMTRADE file format through PC maintenance software
  - Memory size: 2 Mbytes
Communication
- Supports DNP3.0 Subset level 3, DNP over TCP/IP
- IEC60870-5-101, 104
- Index mapping & class assignment
- Modem control
- Unsolicited Dial-Up
- Built-in protocol monitor

Auxiliary functions
- Self-diagnosis
- CAN interface with controller
- PC software for setting & maintenance
- Waveform evaluation software
- Firmware upgradable at site

Typical Application

Typical application example of FTU-P200

Fault Detection & Protection

<table>
<thead>
<tr>
<th>Phase Fault</th>
<th>FTU-P200</th>
<th>FTU-R200</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTU-P200</td>
<td>- Pickup Level : 10–900A (step: 1A)</td>
<td>- Pickup Level : 5–900A (step: 1A)</td>
</tr>
<tr>
<td></td>
<td>- Detection Time : 0.02–10.00 sec (step: 0.01 sec)</td>
<td>- Fast TC Curve : 1–48 (step: 1)</td>
</tr>
<tr>
<td></td>
<td>- Fast TC Curve : 54 types (ANSI, IEC, Recloser)</td>
<td>- Fast Multiplier : 0.10–2.00 (step: 0.01)</td>
</tr>
<tr>
<td></td>
<td>- Fast Adder : 0.00–1.00 sec (step: 0.01 sec)</td>
<td>- Fast Adder : 0.00–1.00 sec (step: 0.01 sec)</td>
</tr>
<tr>
<td></td>
<td>- Fast Min Response Time</td>
<td>- Fast Min Response Time</td>
</tr>
<tr>
<td></td>
<td>: 0.00–1.00 sec (step: 0.01 sec)</td>
<td>: 0.00–1.00 sec (step: 0.01 sec)</td>
</tr>
<tr>
<td></td>
<td>- Time-delayed TC Curve</td>
<td>- Time-delayed TC Curve : 1–48 (step: 1)</td>
</tr>
<tr>
<td></td>
<td>: 54 types (ANSI, IEC, Recloser)</td>
<td>- Time-delayed Multiplier : 0.10–2.00 (step: 0.01)</td>
</tr>
<tr>
<td></td>
<td>- Time-delayed Multiplier : 0.00–1.00 sec (step: 0.01)</td>
<td>- Time-delayed Adder : 0.00–1.00 sec (step: 0.01 sec)</td>
</tr>
<tr>
<td></td>
<td>- Time-delayed Min Response Time</td>
<td>- Time-delayed Min Response Time</td>
</tr>
<tr>
<td></td>
<td>: 0.00–1.00 sec (step: 0.01 sec)</td>
<td>: 0.00–1.00 sec (step: 0.01 sec)</td>
</tr>
</tbody>
</table>

Earth Fault

| FTU-P200 | - Pickup Level : 3–900A (step: 1A) | - Detection Time : 0.02–10.00 sec (step: 0.01 sec) |
| FTU-R200 | - Fast TC Curve : 1–48 (step: 1) | - Fast Multiplier : 0.10–2.00 (step: 0.01) |
|          | - Fast Adder : 0.00–1.00 sec (step: 0.01 sec) | - Fast Adder : 0.00–1.00 sec (step: 0.01 sec) |
|          | - Fast Min Response Time | - Fast Min Response Time |
|          | : 0.00–1.00 sec (step: 0.01 sec) | : 0.00–1.00 sec (step: 0.01 sec) |
|          | - Time-delayed TC Curve : 1–48 (step: 1) | - Time-delayed Multiplier : 0.10–2.00 (step: 0.01) |
|          | - Time-delayed Adder : 0.00–1.00 sec (step: 0.01 sec) | - Time-delayed Adder : 0.00–1.00 sec (step: 0.01 sec) |
|          | - Time-delayed Min Response Time | - Time-delayed Min Response Time |
|          | : 0.00–1.00 sec (step: 0.01 sec) | : 0.00–1.00 sec (step: 0.01 sec) |
### FTU-200 series

#### Direction Detection
- **3V1 threshold** 0~100% (step: 1%)
- **3I1 threshold** 0~100% (step: 1%)
- **3I1 Max. torque angle** 0~355° (step: 5°)
- **3W0 threshold** 0~100% (step: 1%)
- **3W0 Max. torque angle** 0~355° (step: 5°)

#### Under voltage
- **Pickup Level** 0.30~0.95 pu (step: 0.01pu)
- **Delay time** 0.1~180.0 sec (step: 0.1sec)

#### Over voltage
- **Pickup Level** 1.05~1.50 pu (step: 0.01pu)
- **Delay time** 0.1~180.0 sec (step: 0.1sec)

#### Under frequency
- **Pickup Level** 47.00~59.98 Hz (step: 0.01Hz)
- **Delay time** 0.03~10.00 sec (step: 0.01sec)

#### Over frequency
- **Pickup Level** 52.02~63.00 Hz (step: 0.01Hz)
- **Delay time** 0.03~10.00 sec (step: 0.01sec)

#### Open Line (Loss of Phase) Detection
- **Voltage On Level** 50~90% (step: 5%) of rated voltage
- **Voltage Off Level** 35~75% (step: 5%) of rated voltage
- **Delay time** 0.1~30.0 sec (step: 0.1sec)

#### Phase Synchronism Check
- **Sync Fail Phase Difference** 5~60° (step: 1°)
- **Delay Time** 0.1~30.0 sec (step: 0.1sec)

#### Reclosing (FTU-R200)
- **1st Dead Time** 0.5~180.0 sec (step: 0.1sec)
- **2nd Dead Time** 1~180 sec (step: 1sec)
- **3rd Dead Time** 1~180 sec (step: 1sec)
- **4th Dead Time** 1~180 sec (step: 1sec)
- **Reset Time** 3~180 sec (step: 1sec)
- **SEF 1st Dead Time** 0.5~180.0 sec (step: 0.1sec)
- **SEF 2nd Dead Time** 1~180 sec (step: 1sec)
- **SEF 3rd Dead Time** 1~180 sec (step: 1sec)
- **SEF 4th Dead Time** 1~180 sec (step: 1sec)
- **SEF Reset Time** 3~180 sec (step: 1sec)
- **Phase Operation Count** 1~5
- **Earth Operation Count** 1~5
- **SEF Operation Count** 1~5
- **Phase Fast Operation Count** 0~5
- **Earth Fast Operation Count** 0~5
- **Phase HCT Operation Count** 0~5
- **Earth HCT Operation Count** 0~5
- **Sequence Coordination** 1 (on) / 0 (off)
- **Single shot time** 0~180 sec (step: 1sec)

#### Auto Sectionalizing (FTU-P200)
- **Fault count** 1~3 (step: 1)
- **Reset Time** 20~240 sec (step: 1sec)

#### Analog High/Low Alarm
- **Phase current**
- **Earth current**
- **NPS Current**
- **Phase voltage**
- **Power**
4 Setting Groups

- Active Default Setting Group: 1~4
- Automatic Default Group Selection: 1 (on) / 0 (off)
- Reverse power flow group: 1~4

System Configuration

I/O

- DI Debounce Time: 10~500 msec (step: 5 msec)
- DO Pulse Width: 10~8000 msec (step: 10 msec)

AC Rating

- Line Configuration: Y-G/DELTA
- System Frequency: 50 or 60 Hz
- Rated Voltage (L-L): 1.00~40.00 kV (step: 0.01 kV)
- Reference Voltage (L-N): 1.00~30.00 kV (step: 0.01 kV)
- Reference Phase: A/B/C
- CT Ratio (1A nominal): 1~5000 (step: 1)
- CT Direction: FWD/REV
- NCT Ratio (1A nominal): 1.0~5000.0 (step: 0.1)
- NCT Direction: FWD/REV
- Phase Rotation: A-B-C/A-C-B

Waveform Trigger

- Sample Record Frequency: 16/32/64/128 Samples per cycle
- Pre-1st Cycle: 1~5 cycle
- Post 2nd Cycle: 1~5 cycle
- Pre-2nd Trigger cycle: 1~10 cycle

Demand Interval

- Block Interval: 15/30/60 min
- Rolling Interval: 1/5/15/30/60 min

FI Reset

- FI Reset Select: Manual/Auto
- FI Reset Time: 0~12 Hour

Close Interlock

- Live Load: No/Yes
- Sync. Fail: No/Yes

Voltage Display

- Mode: L-N/L-L

Automatic Battery Check

- Checking Cycle: 1~30 Day
- Checking Time: Hour/Min

Power Quality Monitoring

Voltage Unbalance

- Detection Level: 0~100 % (step: 1 %)
- Detection Time: 0.1~60.0 sec (step: 0.1 sec)

Current Unbalance

- Detection Level: 0~100 % (step: 1 %)
- Detection Time: 0.1~60.0 sec (step: 0.1 sec)

Sag

- Detection Level: 0.50~0.99 pu (step: 0.01)
- Detection Time: 0.5~10.0 cycle (step: 0.5 cycle)

Swell

- Detection Level: 1.01~1.50 pu (step: 0.01)
- Detection Time: 0.5~10.0 cycle (step: 0.5 cycle)

Interruption

- Detection Level: 0.10~0.49 pu (step: 0.01)
- Detection Time: 0.5~10.0 cycle (step: 0.5 cycle)

Voltage THD Alarm

- Alarm Level: 0.5~100.0 % (step: 0.1 %)
- Detection Time: 0.2~60.0 sec (step: 0.2 sec)

Current THD Alarm

- Alarm Level: 0.5~100.0 % (step: 0.1 %)
- Detection Time: 0.2~60.0 sec (step: 0.2 sec)

Status Monitoring

10 Contacts Input

- configurable [signal name, interlock, invert]
- DC 24V, opto-isolated

Power supply status

- External Power, Battery low, Battery fail, Charger Fail

Control

4 Contact relay outputs

- Rated current: 16A
- Mechanical Life: >30x10^6 operations
- Operate time: typical 7ms

2 Photomos Relay Outputs

- Rated current: 120mA
FTU-200 series

Switch Control
- SBO (Select before Operate - Open/Close)
- Password protection
- Local/Remote, Control Lock

Reset Annunciator

Battery Test

Protection Function Blocking
- Reclosing / Protection (All) / Earth Protection (Earth & SEF)

LCD
- 20characters * 4 lines, LED backlight

LED
- Switch status: Open, Closed, Gas low
- Control status: Remote, Recloser Enable, Protection Enable, Ground Enable, Control Lock, Select
- Function status: Live line (Source/Load), PFI A/B/C/N/SEF, U/V/W, Sync Fail, Reclosing Ready/Progress/Lockout
- Comm. status: Tx, Rx, RTS (SCADA Port), Ethernet Link, Active Tx, Rx (protection data)
- System status: CPU Run, Error

Button
- MENU/UP/DOWN/ENTER, REMOTE, CONTROL LOCK, SELECT, OPEN, CLOSED, RESET, RECLOSER ENABLED, PROTECTION ENABLED, GROUND ENABLED, BATTERY TEST, LAMP TEST

Measurements

Current
- RMS (A) & Phase Angle (Deg)
- True RMS (A)
- Accuracy ±1% or 1A (2~600A), ±3% (600~12,000A)
- Reading Range 2~12,000A (External CT Ratio 1,000:1)

Voltage
- RMS (kV) & Phase Angle (°)
- Sequence Component
- Va-Vr Phase Angle Difference (°)
- Reading Range 0.1~40kV
- Accuracy ±1% or 0.1kV

Power
- A-phase, B-phase, C-phase and 3-phase
- Active (kW), Reactive (kVAR), Apparent (kVA)
- Accuracy ±2%

Power Factor
- A-phase, B-phase, C-phase and 3-phase
- Lead / Lag display
- Accuracy ±4%

Frequency
- Measuring range 45~65 Hz
- Accuracy ±0.02 Hz

Energy
- A-phase, B-phase, C-phase and 3-phase
- Rollover 16-bit counter: kWh, kVARh (Import & Export)
- Accuracy ±4%

Harmonics
- Ia, Ib, Ic, In and I3ph THD (%)
- Source-side Va, Vb, Vc and V3ph THD (%)
- 2nd~31st Harmonics (A, W) Ia, Ib, Ic, In, Va, Vb, Vc

VOC (Value Of Change)

Recording
- Time tag 1ms time resolution
- I/O events (1023) / Functional events (1023) / System events (255) / Fault events (255) / Demand profile I,P,Q (1023) / Maximum demand profile I,P,Q (255)
- Event size can be expanded due to user requirements

Counter
- FTU Restart Count, Switch Trip (Open) Count
- Fault Count (A / B / C / N), Total Fault Count

Fault/PQM Waveform
- Up to 15 waveforms are stored (128 samples/cycle, 20 cycles)
- Data can be stored as COMTRADE file format

General Specifications

Power Inputs
- AC 127 / 220V (50 or 60 Hz)
- Step down transformer output: AC 30V, 200~500VA

Power Supply Unit
- Input Voltage AC 30V
- Output Voltage DC 24V
- Battery Charging Voltage 27V (Temperature Compensated)
- Over-discharge disconnection, Battery Check & Charger Circuit
- CAN interface with FTU
**LBS or Recloser Interface**

- Basically, FTU-P200 and FTU-R200 have 2 receptacles for MS Connectors on the enclosure bottom. (3-pin cable for external AC power input & 37-pin control cable for switch interface) Control cable pins include 3 CT’s analog inputs for currents, 6 PT’s analog inputs for source-side (A/B/C) and load-side (R/S/T) voltages, digital inputs for status monitoring, and digital outputs for control. This original interface configuration can be customized for external CT/PT connections.

**Battery (Lead Acid)**

- Output, Capacity: DC12V * 2, 18 Ah (standard)
- Run Time: over 24 hrs without AC power
- Switch Control: over 100 times without AC power
- Recharging Time: within 24 hrs after full discharge
- Life Guarantee: 5 years

**FTU Power Supply**: DC 24V

**Modem Power Supply**: DC 12V/24V (Ordering option)

**Dimensions**

- Enclosure: H650 × W450 × D250 mm
- FTU: H340 × W260 × D102 mm
- Modern space: H300 × W75 × D200 mm

**Weights**

- Control Box (Gross): 57 kg
- FTU (only): 4 kg

**Heater**

- Power Consumption: 25W

**Operating Temperature**

- -25 – +70 °C (Ambient)

**Humidity**

- ≤95 % RH

**Altitude**

- up to 3000 m

**Enclosure Material**

- Stainless Steel, 2t (IP54)

**Test Standards**

- Dielectric Strength: IEC 60255-5
- Impulse: IEC 60255-5
- 1 MHz Burst: IEC 61000-4-12 class 3
- Fast Transient: IEC 61000-4-4 class 4
- Radio Frequency noise: IEC 61000-4-3, 10V/m
- Vibration: IEC 60255-21-1
- KSC 0220: Low Temperature Test
- KSC 0221: High Temperature Test

**Communication Interface**

### RS 232C Port #1

**Optical isolation, ESD/Transient noise protection**

**Modem control supports**

- DCD, RTS/CTS, DTR/DSR

**Protocols**

- DNP 3.0 (Level 3) or IEC60870-5-101

**Baud Rate**

- 1200 ~ 19200 bps

**Connector Type**

- DB9 Male

### RS 232C/RS485 Port #2

**Optical isolation, ESD/Transient noise protection**

**Protocols**

- DNP 3.0 (Level 3) or IEC60870-5-101

**Baud Rate**

- 1200 ~ 19200 bps

**Connector Type**

- DB9 Male, Pin4 is mode pin to select RS232C or RS485

### TCP/IP

**10/100 BASE-T**

**Protocols**

- DNP3.0 over TCP, IEC60870-5-104

### Maintenance Port

**RS232C, 115.2kBPS, MODBUS**

**Connector Type**

- DB9 Female
INTRODUCTION

FTU is a remote terminal unit which controls and monitors switches such as LBS, Recloser, RMU.

FTU-200C series is the compact version of FTU-200 series. The main features of FTU-200C series are same as FTU-200 series, but the communication ports such as Ethernet port that are not wisely used are removed to meet various customer's needs.

We are fully confident that you can enjoy state-of-the-art technology of FTU-200C series with economical price.

COMPARISON TABLE

<table>
<thead>
<tr>
<th>MEASUREMENT</th>
<th>P200</th>
<th>R200</th>
<th>S200</th>
<th>P200C</th>
<th>R200C</th>
<th>S200C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. TD input</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

COMMUNICATION PROTOCOLS

<table>
<thead>
<tr>
<th>PROTOCOLS</th>
<th>P200</th>
<th>R200</th>
<th>S200</th>
<th>P200C</th>
<th>R200C</th>
<th>S200C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Setting &amp; Maintenance: Modbus-RTU</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. SCADA</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. DNP3.0</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>B. DNP3.0 over TCP/IP</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. IEC60870-5-101</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. IEC60870-5-104</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Configurable DNP3.0 point index</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Dial-up Modem control</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

COMMUNICATION INTERFACE

<table>
<thead>
<tr>
<th>INTERFACE</th>
<th>P200</th>
<th>R200</th>
<th>S200</th>
<th>P200C</th>
<th>R200C</th>
<th>S200C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. RS232C on FTU front panel for maintenance</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>2. RS232C on FTU left side</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. RS232/485C</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Ethernet</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. CAN</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ORDERING INFORMATION

FTU - 200 (C)

(Order): standard type (C): Compact type functionally

P: Pole-mounted LBS controller R: Automatic circuit recloser controller
S: Pole-mounted Sectionalizer controller

Feeder Terminal Unit

Head Office & Factory
Tel: +82-31-452-5791 Fax: +82-31-452-5793
R&D Center Tel: +82-31-452-5857

Seoul Office
Tel: +82-2-2240-8106 Fax: +82-2-2240-8188
FTU-200 series

Outline & Dimension

Enclosure Dimensional Drawings
FTU Interface Connectors

Construction

Example of arrangements inside enclosure of pole-mounted FTU
Various types of Device for Distribution Automation

- **FTU-P100 / S100 / R100**
  Standard Controller model for Pole-mounted Load Break Switch / Sectionalizer / Automatic Circuit Recloser

- **FTU-GD100**
  Controller for Pad-mounted multi circuits LBS

- **FTU-RC100**
  Controller for Ring Main Circuit Breaker

- **ALTS Controller**
  Controller for ALTS (Automatic Load Transfer Switch)

- **TTU ( Transformer Terminal Unit)**
  Power quality monitoring device for LV side of distribution transformer
P&C Technologies Co., Ltd.

Head Office & Factory
Address: #898-43, Hogye-dong, Dongahn-gu, Anyang, Kyongki-do, 431-080, Korea
Tel: +82-31-452-5791   Fax: +82-31-452-5793
R&D Center Tel: +82-31-452-5857

Seoul Office
Address: 5F, Kwangmyung B/D, #115-3, Bangi-dong, Songpa-gu, Seoul, 138-050 Korea
Tel: +82-2-2240-8106   Fax: +82-2-2240-8188
http://www.pnctech.co.kr