# FUTUREDESIGN

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## CONTROLS

# PR Series

# Paperless Recorders & Process Controllers

| | PR10 | PR20 | PR30 |
|---|---|---|---|
| Product Description | low-cost 4.3" touch screen recorder supports 1, 2, 3 or 6 universal analog inputs | intermediate 5.6" touch screen up to 24    high-resolution analog inputs | large 12.1" high-resolution touch screen recorder supports up to 48 universal analog inputs |
| Input numbers | 3, 6 channels | 3, 6, 12, 18, 24 channels | 6, 12, 18, 24, 30, 36, 42, 48 channels |
| True universal inputs | Thermocouples: J, K, T, E, B, R, S, N, L, U, P, W5, W3, LR, A1, A2, A3, M<br>RTD: Pt50, Pt100, Pt200, Pt500, Pt1000 ($\alpha$=0.00385), Pt50, Pt100 ($\alpha$=0.00391),    JPt50, JPt100, JPt200, JPt500, JPt1000 ($\alpha$=0.003916)<br>Cu10 ($\alpha$=0.00427), Cu50, Cu100($\alpha$=0.00426, 0.00428), Ni100, Ni200, Ni500,    Ni1000 ($\alpha$=0.00617) mA, V, mV | | |
| Scan Rate / Data Log Interval | analog inputs scanned every 100ms / Data log interval configurable,    100ms, 1, 2, 5, 10, 20, 30 seconds, 1 or 2 minutes. | | |
| Math, External channels, Batch Data Log, Custom display, FDA, CFR21 part 11 | Math functions, including Counters & Totalizers, are standard with other listed functions in Plus Version Firmware | | |
| Display | 4.3" TFT wide touch screen | 5.6" TFT touch screen | 12.1" TFT touch screen |
| Resolution | 480 x 272 | 640 x 480 | 1024 x 768 |
| MTFB backlight at 25°C | 30,000 hrs | 30,000 hrs | 60,000 hrs |
| Backlight | LED | | |
| Screen saver, Email | Yes | | |
| CPU Speed | ARM Cortex-A8, 1Ghz | | |
| Internal Flash memory | 256 MB | | |
| RAM | 256 MB | | |
| Ethernet | Modbus TCP/IP | | |
| RS-232/422/485 | optional RS-232 or RS-422/485 Modbus RTU | | |
| SD card slot / USB ports / Printer Output | 1 SD Card Slot / 2 USB ports one front with 2nd back / Printer output via USB ports    or LAN | | |
| Pulse input | optional DI card offering either logic or high frequency pulse counter | | |
| Process control | PID ramp & dwell | PID ramp & dwell | N/A |
| START / STOP key | to start / stop data logging and to turn display only off (not the recorder) | | |
| Calibration | field calibration may be accomplished for all analog input types as well as offering    Offset and Gain adjustments | | |
| Multilingual | convenient for local users by offering 20 languages including English, Japanese, Danish, Italian, Polish, Russian, Dutch, Korean, Thai, Turkish, Portuguese, | Chinese(simplied, traditional), French, German, Spanish, Swedish, Brazil Portuguese, Czech, Greek and other languages negotiable | |
| PC software Historical Viewer+ Configuration | Standard – on PC view, print, export (.csv) all data and other files and    to create/edit unit configuration files | | |
| Extensive software Data Acquisition Studio | optional, same as Historical Viewer but supports real-time remote    monitoring of multiple PR units, data logging at PC and more | | |
| Power supply | 90-250VAC or 11-36VDC | | |
| Outer dimensions (W x H x L ) | 144mm x 144mm x189mm / 5.67" x 5.67" x 7.44" | 144 x144 x189    5.67"x5.67"x7.44" | 288mm x 288mm x 189mm / 11.4" x 11.4" x 7.44" |
| Mounting depth | 171mm / 6.74" | 171mm / 6.74" | 171mm / 6.74" |
| DIN Panel cutout (W x H ) | 137mm x 137mm / 5.4" x 5.4" | 137mm x 137mm    5.4" x 5.4" | 281mm x 281mm / 11.06" x 11.06" |
| Protection | IP65 front, IP20 rear | | |
| Operating temperature | 0°C to 50°C | | |
| Storage temperature | -30°C to 70°C | | |
| Agency Approvals | UL, cUL, CE, RoHS | UL, cUL, CE, RoHS | RoHS |

## Overview

The PR Series paperless recorders offer outstanding specifications and features.

The PR Series includes the low-cost 4.3" PR10, intermediate 5.6" PR20 and the high-end 12.1" PR30 each offering a host of standard and optional features. These features include easy to use touch screen interface, 100msec sampling rate, monitor external channels (via TCP/IP or serial modbus), normal & high frequency pulse inputs, batch recording, write free-hand messages directly on the display, supports field calibration, multilevel security, customizable display, Web Server, email, 20-languages, TCP/IP, SD slot, two USB ports and can meet the requirements for CFR21 part 11, AMS2750E*, JCAHO, typical HACCP protocols and other standards.

* PR Series T/C input types J, K, T, N, U, L, P and RTD meet AMS2750E accuracy requirements
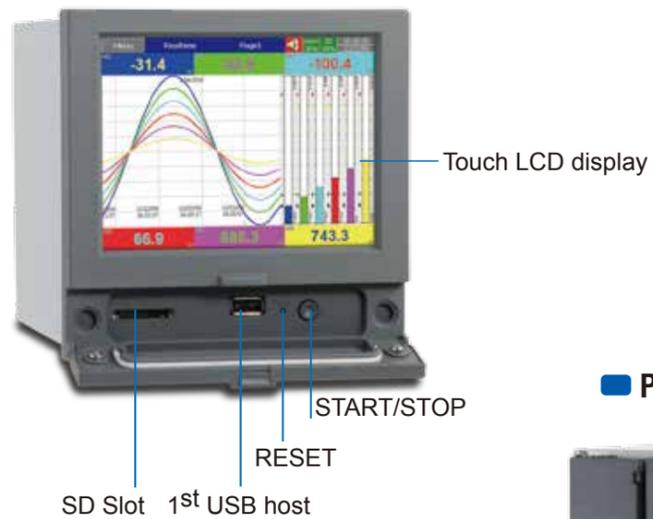
PID Process Control Function for PR10 & PR20 provides a combination process controller with profiling as well as powerful paperless recorder functions.
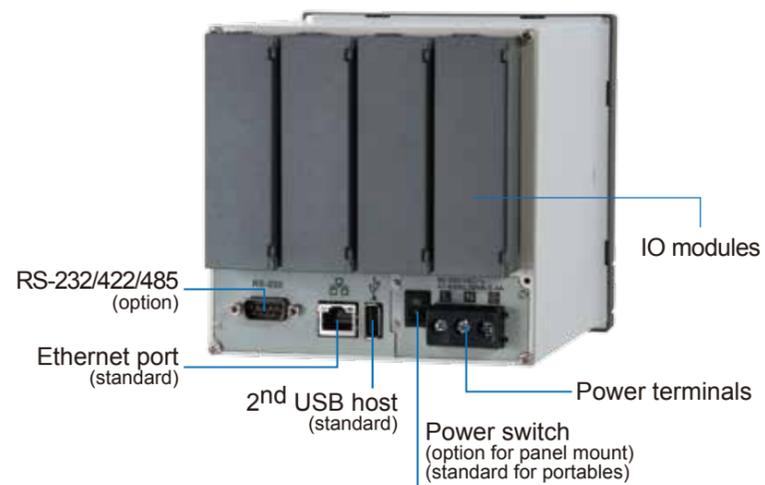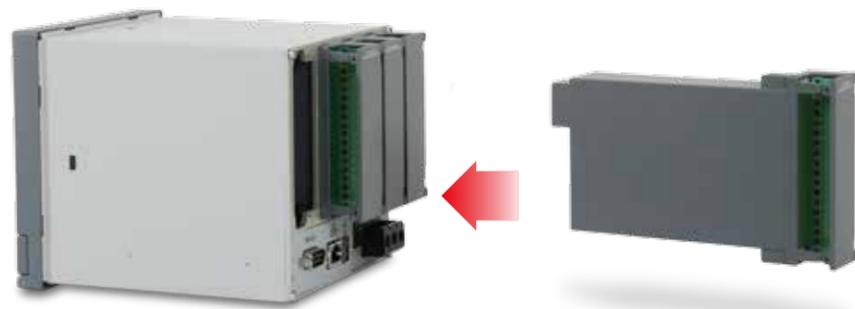
# Modular Hardware Design

## Front view, Back view

### PR20 Front view

Touch LCD display

START/STOP

RESET

SD Slot   1st USB host

### PR20 Back view

RS-232/422/485
(option)

Ethernet port
(standard)

2nd USB host
(standard)

Power switch
(option for panel mount)
(standard for portables)

Power terminals

IO modules

### IO modules allow for easy for expansion

## Input & Output Modules

**AI206**
6 AI (6 analog inputs)

**AI203**
3 AI (3 analog inputs)

**RO206**
6 relay outputs

**DI206**
6 DI (6 digital inputs)

**RD233**
3 relays + 3DI

**AO206**
6 AO (6 analog outputs)

**PC201**
single loop process control

**PR10**
(4 Slots, up to 6 AI)

**PR20**
(4 Slots, up to 24 AI)

**PR30**
(16 Slots, up to 48 AI)

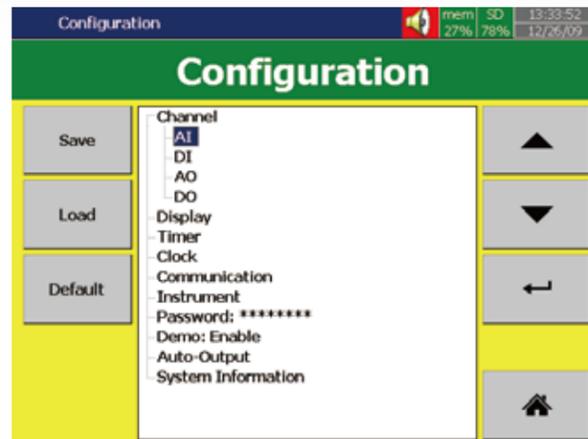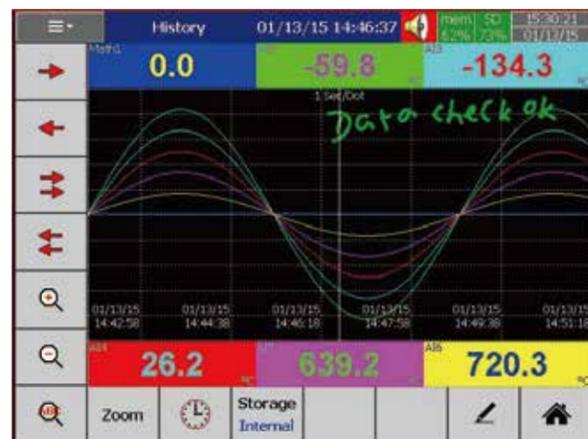## Portable recorders and the front access door Security key

### Portable recorders

### Security key

PR10     PR20     PR30
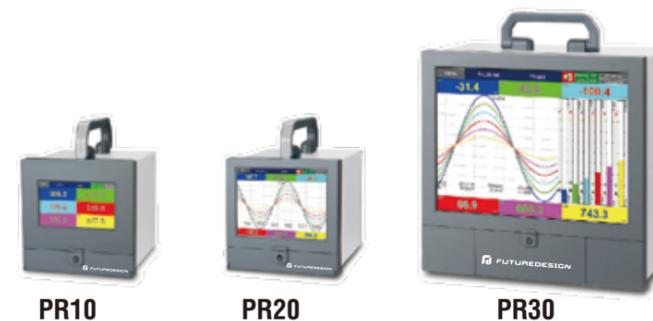
## Configuration Menu provides easy navigation & selection



## Supports free-hand messages directly on the touch screen



## Circular display (PR30 only)

PR30 offers Circular Chart view allowing easy replacement for 1 to multiple legacy circular chart recorders while providing secure electronic data files. This chart view is configurable for a variety of time formats from 30 minutes to 4-weeks.



## Standard version of Firmware

**AI:** Analog input offers configurable log interval: 100ms, 1, 2, 5, 10, 20, 30 Sec, 1, 2 Min/Dot.

**DI:** Digital input configurable as normal Logic or high frequency Pulse.

**AO:** Analog Retransmission Output, mA or VDC.

**DO:** Digital output/relay output can be enabled. Each DO card has 6 relays.

**Display:** Configurable display speed: 100ms, 1, 2, 5, 10, 20, 30 Sec/Dot, or 1, 2, 10, 30 Min/Page, 1, 2, 4, 8, 12 Hour/Page, or 1 Day/Page.

**Timer:** Timer functions include Countdown, Repeat Countdown, Daily, Weekly or Monthly base as well as defining a variety of jobs.

**Clock:** Configurable Date Style (MM/dd/yy or dd/MM/yy), Daylight Savings as well as Time Synchronize via LAN.

**Communication:** As standard Web Server and email functions are available via LAN. Alarms/events are configurable to have emails sent upon their activation.

**Instrument:** Adjustable display brightness, Screen Saver time as well as other settings.

**Security:** The Normal Security supports one password. With the optional CFR21 High Security system supports up to 30-users, 9 security levels, password aging, operator audit trail and auto logout.

**Demo:** Enable or disable the demonstration mode.

**Printer Auto-output:** An automatic output of Historical data, Report data or other preselected data may be sent to a selected printer.

**System information:** Provides Firmware version number, Internal & External memory status, IP address and IO card status of each Slot.

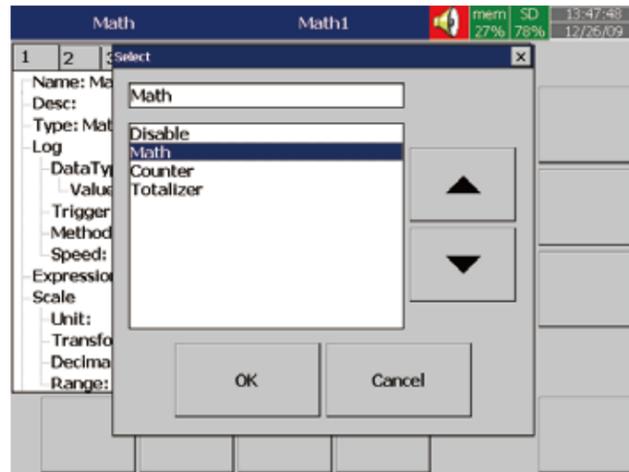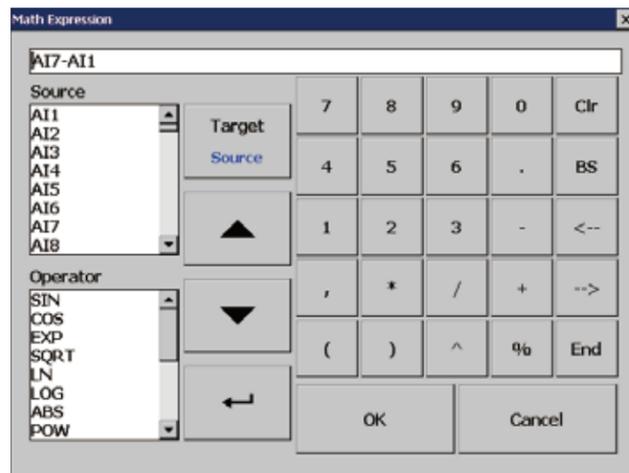**Field Calibration:** Analog channels may be easily field calibrated.

# Additional Functions

## Standard version of Firmware

**Standard Firmware version includes Mathematics, Counters & Totalizer**

**Math:** It includes Math, Counter & Totalizer.



Math Expression is entered directly



## Plus version of Firmware

Plus versions of Firmware offer additional features: External Channels, Custom Display, Batch, High Frequency Pulse input and FDA CFR21 part 11.

**External Channels:** In addition to the AI & DI inputs the PR recorders may accept additional inputs through serial or Ethernet TCP communication referenced as External Channels. The PR10, PR20 & PR30 may accept up to 24, 48 & 96 External Channels respectively.
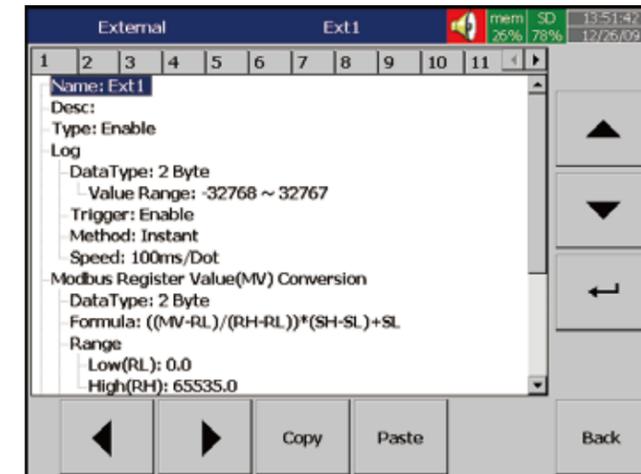


**Custom Edited Display:** The Plus Version firmware 2 & 3 includes PC software Panel Studio allowing users to create/edit custom display views that can include animation and then download to PR recorders.



**Batch:** Data Log files may be created by Batch allowing a custom batch and lot number name for the file, typically desired for food, pharmaceutical processing as well as other applications.

**FDA, CFR21 part 11:** The CFR21 part 11 feature meets the requirements for U.S. Food and Drug administration.
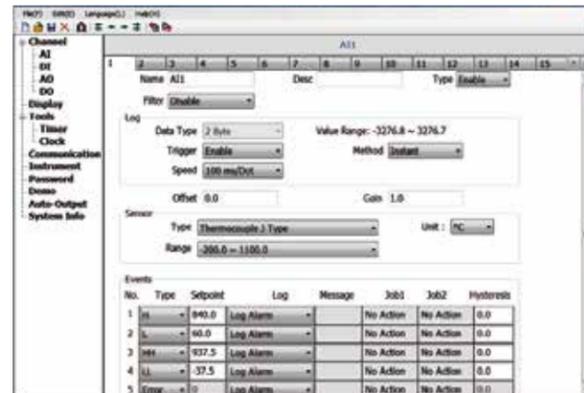
## Standard PC Software

The standard software consists of two parts, Configuration and Historical Viewer.
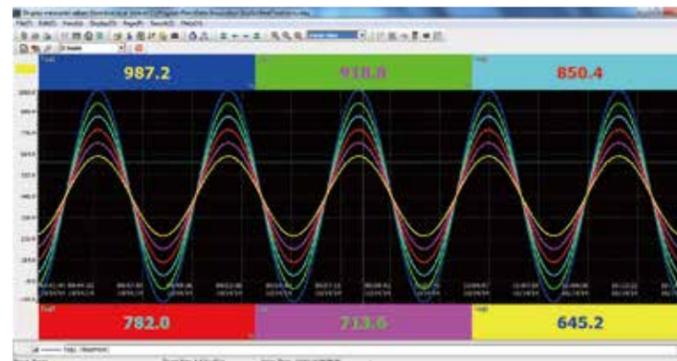
### I. Configuration

The PC Software allows an easy method to create, edit and save recorder configuration. Configuration files may be easily imported/exported to PR recorder.



### II. Historical Viewer

Display, print and export (.csv) historical data, chart trends, alarms and events. Search data by time, time period, tag, alarm, events and operator remarks.



## Extensive software Data Acquisition Studio

### III. RealTime Viewer

In addition to the Configuration & Historical Viewer, the Data Acquisition Studio software includes RealTime Viewer to provide real-time monitoring of multiple PR recorders via serial or Ethernet TCP as well as offering additional features.
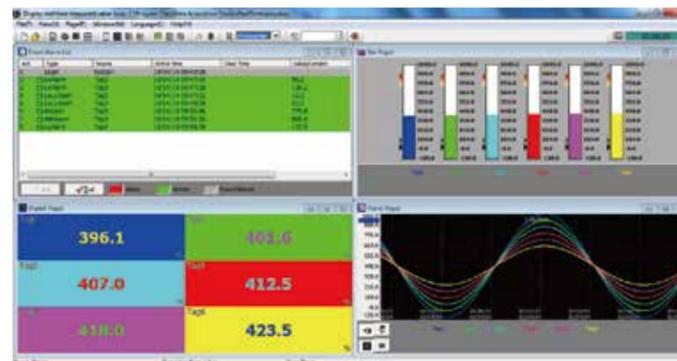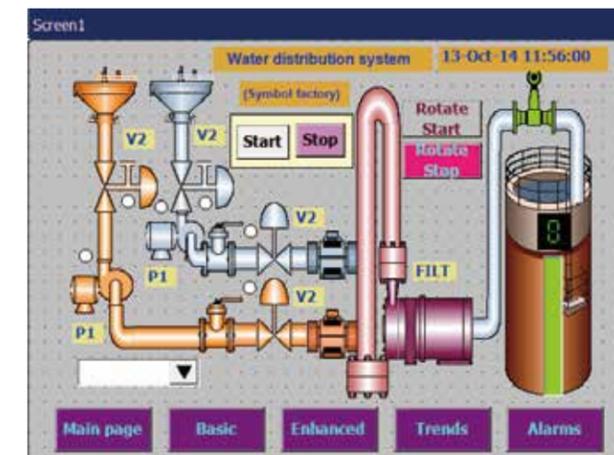


### IV. Panel Studio

With Plus version 2 or 3 Firmware, Panel Studio PC software is provided to allow the creation/editing of custom display views that may include animation. When completed on a PC the custom views are downloaded to the recorder. The custom display views are in addition to the standard views.
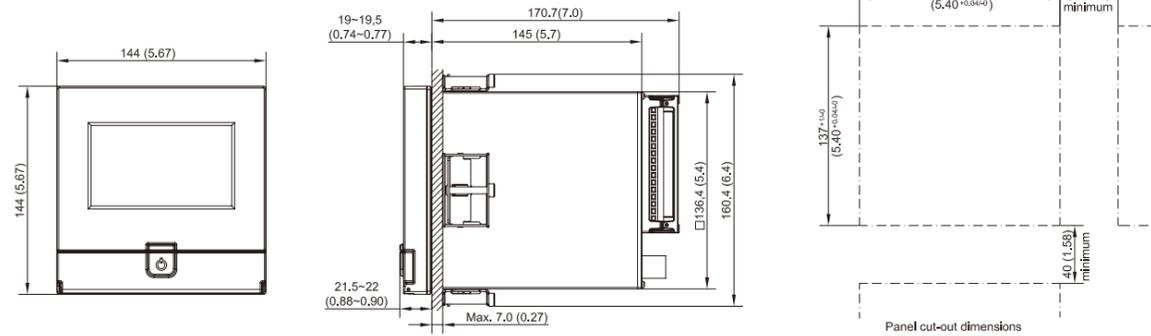
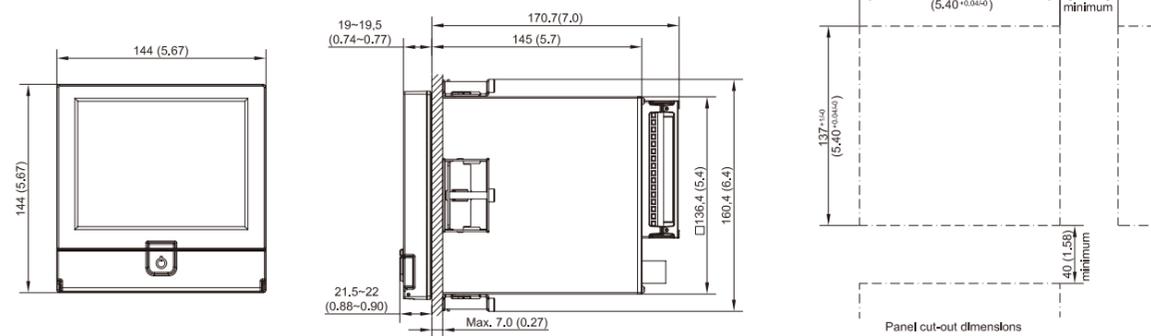Edit it on PC



Download it onto recorders
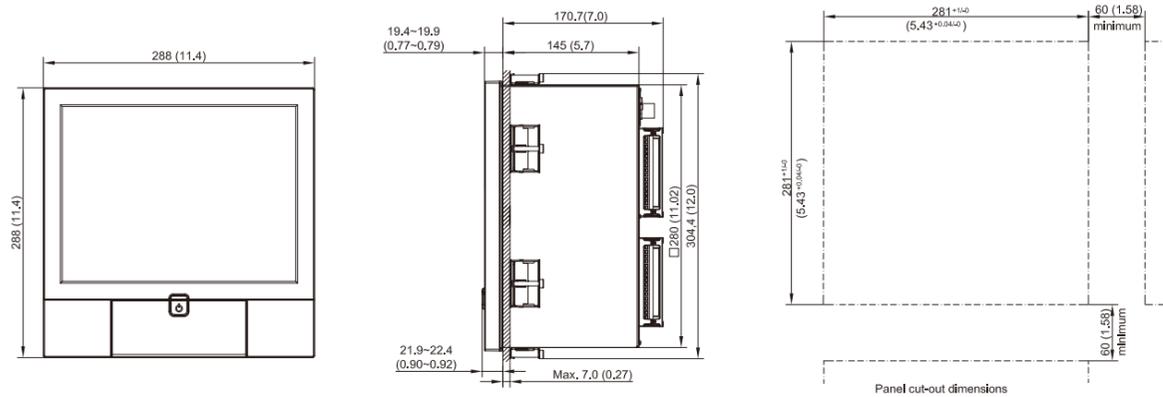
## Dimensions in mm (in.)

### PR10

144 (5,67)
144 (5,67)

19~19,5 (0,74~0,77)
170,7(7,0)
145 (5,7)

137 +1/-0 (5,40 +0,04/-0)
□136,4 (5,4)
160,4 (6,4)

21,5~22 (0,88~0,90)
Max. 7.0 (0,27)

137 +1/-0 (5,40 +0,04/-0)
40 (1.58) minimum

137 +1/-0 (5,40 +0,04/-0)
40 (1,58) minimum

Panel cut-out dimensions

### PR20

144 (5,67)
144 (5,67)

19~19,5 (0,74~0,77)
170,7(7,0)
145 (5,7)

137 +1/-0 (5,40 +0,04/-0)
□136,4 (5,4)
160,4 (6,4)

21,5~22 (0,88~0,90)
Max. 7.0 (0,27)

137 +1/-0 (5,40 +0,04/-0)
40 (1.58) minimum

137 +1/-0 (5,40 +0,04/-0)
40 (1,58) minimum

Panel cut-out dimensions

### PR30

288 (11,4)
288 (11,4)

19,4~19,9 (0,77~0,79)
170,7(7,0)
145 (5,7)

281 +1/-0 (5,43 +0,04/-0)
□280 (11,02)
304,4 (12,0)

21,9~22,4 (0,90~0,92)
Max. 7,0 (0,27)

281 +1/-0 (5,43 +0,04/-0)
60 (1.58) minimum

281 +1/-0 (5,43 +0,04/-0)
60 (1,58) minimum

Panel cut-out dimensions

## Ordering Code

### PR10 Ordering Code

**PR1003**
(3 analog inputs)

**PR1006**
(6 analog inputs)

**Other inputs & outputs*** (PR1003)
0:  none
6:  3 relays + 3 DI

**Other inputs & outputs*** (PR1006)
0:  none
1:  6 relays
3:  6 DI
6:  3 relays + 3 DI
7:  6 relays + 6 DI

**Power**
A:  90-250 VAC, 50/60 Hz
D:  11-36 VDC

**Communication**
0: standard Ethernet
1: Ethernet + RS232
2: Ethernet + RS-422/485

**Firmware**
0: standard version includes Mathematics, Counter & Totalizer
1: Plus version 1 with external channels, batch & FDA, CFR21 part 11
2: Plus version 2 with custom edited display, an editing software Panel Studio to be supplied
3: Plus version 3 including Plus version 1+2 above

**PC software**
1: free basic software of Historical Viewer & Configuration
2: extensive software Data Acquisition Studio (RealTime Viewer + Historical Viewer + Configuration)

**Mounting types, power cord & switch**
0:  panel mount, no power cord, no power switch
1:  panel mount, no power cord, power switch
2:  portable, UL & CSA power cord, power switch
3:  portable, VDE power cord, power switch
4:  portable, SAA power cord, power switch
5:  portable, BS  power cord, power switch
6:  portable, no power cord, power switch
7:  panel mount, UL & CSA power cord, power switch
8:  panel mount, VDE power cord, power switch
9:  panel mount, SAA power cord, power switch
A:  panel mount, BS power cord, power switch

**Special options**
00:  none
S1:  16G SD card
S2:  32G SD card
10:  Process control card
11:  Process control card + 16G SD card
12:  Process control card + 32G SD card

*Notes:   DI - digital inputs
Process control card ordering code needs to be chosen after Special options 10, 11, 12 been selected
When Process control card is specified PR10 is not UL, cUL

### Process Control card Ordering Code

**PC201** —

**Output 1**

0: None
1: Relay 2A/240VAC
2: Pulse voltage to drive SSR, 5V/30mA
3: Isolated 4-20mA/0-20mA (OM95-3)
4: Isolated 1-5V/0-5V (OM95-4)
5: Isolated 0-10V (OM95-5)
6: Triac output 1A/240VAC,SSR
C: Pulse voltage to drive SSR, 14V/40mA (OM94-7)

**Output 2**

0: None
1: Relay 2A/240VAC
2: Pulse voltage to drive SSR, 5V/30mA
3: Isolated 4-20mA/0-20mA (OM95-3)
4: Isolated 1-5V/0-5V (OM95-4)
5: Isolated 0-10V (OM95-5)
6: Triac output 1A/240VAC,SSR
7: Isolated 20VDC/25mA power supply (DC94-1)
8: Isolated 12VDC/40mA power supply (DC94-2)
9: Isolated 5VDC/80mA power supply (DC94-3)
C: Pulse voltage to drive SSR, 14V/40mA (OM94-7)

**Alarm 1**

0: None
1: Form C relay 2A/240VAC

**Alarm 2**

0: None
1: Form A relay 2A/240VAC

## PR20 Ordering Code

**PR2003**
(3 analog inputs)

PR2003 —

**Other inputs & outputs ***
0: none
6: 3 relays + 3 DI
C: 3 relays + 3 DI + 6 AO **

**PR2006**
(6 analog inputs)

**Other inputs & outputs ***
0: none
1: 6 relays
3: 6 DI
5: 6 AO **
6: 3 relays + 3 DI
7: 6 relays + 6 DI
A: 6 relays + 6 AO **
B: 6 DI + 6 AO **
C: 3 relays + 3 DI + 6 AO **
D: 6 relays + 6 DI + 6 AO **

**PR2012**
(12 analog inputs)

**Other inputs & outputs ***
0: none
1: 6 relays
2: 12 relays
3: 6 DI
4: 12 DI
5: 6 AO **
6: 3 relays + 3 DI
7: 6 relays + 6 DI
8: 9 relays + 3 DI
9: 3 relays + 9 DI
A: 6 relays + 6 AO **
B: 6 DI + 6 AO **
C: 3 relays + 3 DI + 6 AO **

**PR2018**
(18 analog inputs)

**Other inputs & outputs ***
0: none
1: 6 relays
3: 6 DI
5: 6 AO **
6: 3 relays + 3 DI

**PR2024**
(24 analog inputs)

**Other inputs & outputs ***
0: none

**Power**
A: 90-250 VAC, 50/60 Hz
D: 11-36 VDC

**Communication**
0: standard Ethernet
1: Ethernet + RS232
2: Ethernet + RS-422/485

**Firmware**
0: standard version includes Mathematics, Counter & Totalizer
1: Plus version 1 with external channels, batch & FDA, CFR21 part 11
2: Plus version 2 with custom edited display, an editing software Panel Studio to be supplied
3: Plus version 3 including Plus version 1+2 above

**PC software**
1: free basic software of Historical Viewer & Configuration
2: extensive software Data Acquisition Studio (RealTime Viewer + Historical Viewer + Configuration)

**Mounting types, power cord & switch**
0: panel mount, no power cord, no power switch
1: panel mount, no power cord, power switch
2: portable, UL & CSA power cord, power switch
3: portable, VDE power cord, power switch
4: portable, SAA power cord, power switch
5: portable, BS power cord, power switch
6: portable, no power cord, power switch
7: panel mount, UL & CSA power cord, power switch
8: panel mount, VDE power cord, power switch
9: panel mount, SAA power cord, power switch
A: panel mount, BS power cord, power switch

**Special options**
00: none
S1: 16G SD card
S2: 32G SD card
10: Process control card
11: Process control card + 16G SD card
12: Process control card + 32G SD card

*Notes: DI - digital inputs, AO – analog retransmission output
Process control card ordering code needs to be chosen after Special options 10, 11, 12 been selected, please refer to page 13
When Process control card is specified PR20 is not UL, cUL
** Process control card cannot be chosen together with PR2003, PR2006, PR2012, PR2018 order codes 5, A, B, C, D nor with PR2024 (24 analog inputs)

## PR30 Ordering Code

**PR3006** (6 analog inputs)
**PR3012** (12 analog inputs)
**PR3018** (18 analog inputs)
**PR3024** (24 analog inputs)
**PR3030** (30 analog inputs)
**PR3036** (36 analog inputs)
**PR3042** (42 analog inputs)
**PR3048** (48 analog inputs)

**Relay outputs**
0: none
1: 6 relays
2: 12 relays
3: 18 relays
4: 24 relays

**Digital inputs**
0: none
1: 6 channels
2: 12 channels
3: 18 channels

**Analog outputs**
0: none
1: 6 channels
2: 12 channels

**Power**
A: 90-250 VAC, 50/60 Hz
D: 11-36 VDC

**Communication**
0: standard Ethernet
1: Ethernet + RS232
2: Ethernet + RS-422/485

**Firmware**
0: standard version includes Mathematics, Counter & Totalizer
1: Plus version 1 with external channels, batch & FDA, CFR21 part 11
2: Plus version 2 with custom edited display, an editing software Panel Studio to be supplied
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**Mounting types, power cord & switch**
0: panel mount, no power cord, no power switch
1: panel mount, no power cord, power switch
2: portable, UL & CSA power cord, power switch
3: portable, VDE power cord, power switch
4: portable, SAA power cord, power switch
5: portable, BS power cord, power switch
6: portable, no power cord, power switch
7: panel mount, UL & CSA power cord, power switch
8: panel mount, VDE power cord, power switch
9: panel mount, SAA power cord, power switch
A: panel mount, BS power cord, power switch

**Special options**
00: none
S1: 16G SD card
S2: 32G SD card