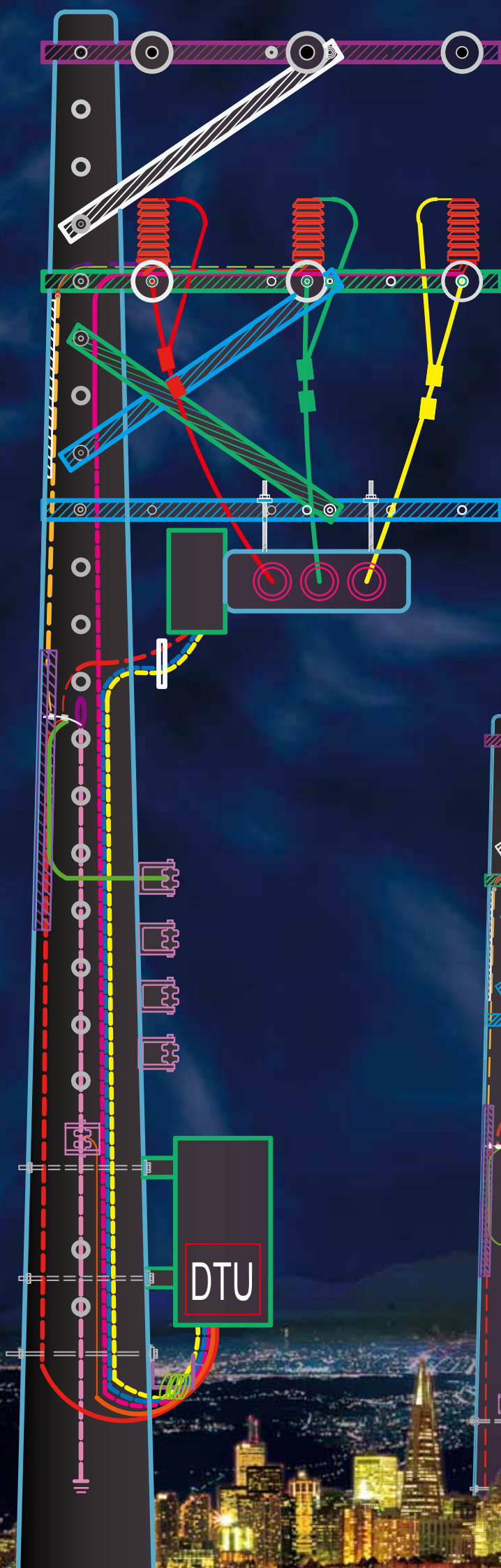
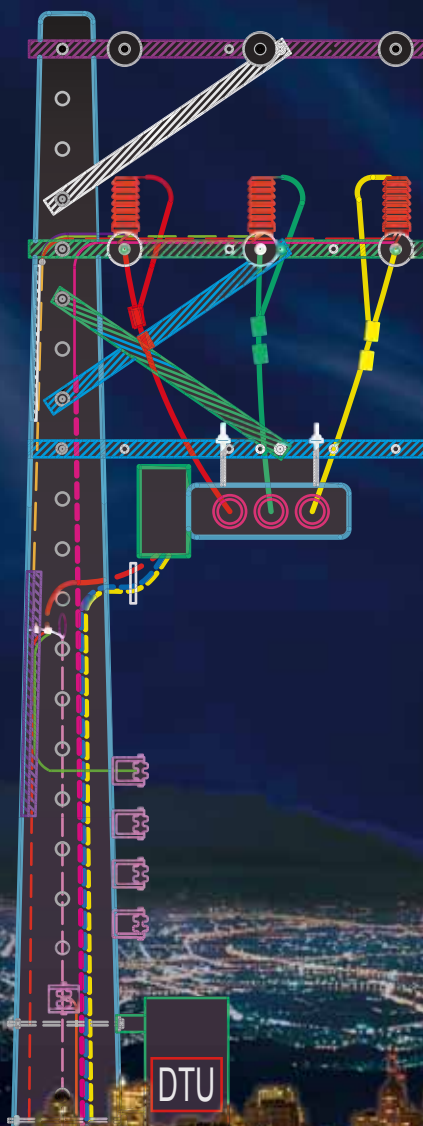


DTU

2300 Series

Distribution Terminal Unit



Distribution Terminal Unit

DTU2300 Distribution Terminal Unit (DTU) successes you with excellent quality, reliability and safety of efficiency performance.



As the demand of smarter operational performance is an increasing trend today, to efficiently and securely monitor/control the whole processes between local/remote locations are not only job site requirements for reducing the rising energy costs but also a need for industrial operations such as oil and gas. The DTU2300 is definitely then solution you need to deliver the expertise and capabilities of your business.

The DTU2300 friendly enables you to monitor, diagnose and maintain your utility assets even in various types of environments. With abilities of accessing to timely and accurate mission-critical information from fixed assets, the DTU2300 will be able to eliminate the critical gaps in operations, resulting in higher productivity and long-term growth.

Features

With great features of easy to use and delivers significant cost savings and values, designed by 30 years experienced senior engineers from HCE, the DTU2300 is not only easy to use and but also delivers significant cost savings and values as list below:

- Wide range environmental specifications from -40 to +70 degrees Celsius continuous operation
- Inherent reliability 32bit Dual CPU, power management/supplies system, communications
- Friendly maintainability – flexible modularization configuration
- High integration with expandable I/O capacity, from 16 to 320 I/O and 22-108 AI
- Central control simplify I/O Module (Free of CPU)
- Wide current range 0.001CT to 20CT
- Power quality analysis IEC 61000-4-30 Harmonics, voltage dips, voltage unbalance, flicker
- Extensive diagnostics for remote health monitoring
- Minimum cost of field mounting
- Low cost of ownership

Promising continuous operations Whenever the event of failure happens, the DTU2300 maintains the operation with capabilities of robust redundancy and flexible communications options.

Firmware updating

In order to maintain operations of DTU2300 on a continuous basis, DTU2300 will be also able to receive a firmware upgraded.

Communication protocols

- DNP3.0 over TCP/IP
- Modbus TCP over Ethernet
- Modbus RTU Serial
- IEC101/104

Every controller offers 2 serial ports which can be configured to be the Modbus Master, together with providing information on its data registers.

Programming Executable

At anytime, the newest program can be downloaded while the existing program is still operating on controllers, which also smartly switches to the new control program automatically without interruption to the operation of the plant. Further, with holding in nonvolatile memory, the DTU2300 control programs are able to automatically restore between the cycles of power of/off of controllers.

Safety for Fails and cold starts

The DTU2300 will be able to either operate autonomously or adopt a user-defined safe state. After the communications have been restored, the DTU2300 continues to operate and the data are logged for transmission. In order to assume the



predefined status, in event of power lose, DTU2300 atomically performs a cold restart and restores the parameters.



Features

With being able to meet demanding of various applications, DTU2300 helps you gaining competitive advantages everywhere.

DTU2300 for your system

Not only the consisting of a mixture of DO and DI cards make the DTU2300 being able to perform the

maximum flexibility for your system, but also the design purpose for DTU2300 is to use in the various industrial environments especially for utilities, with excellent specificationerating over a temperature range of -40°C to +80°C, and it is resistant to 30g shock and 5g vibration.

I/O cards

When output cards receive commands from the controller, they transfer commands to actuators; at the same time, the Input cards receive signals from transmitters and sensors, and convert them digitally to present to the controller. The DTU2300 offers wide ranges of cards, typically including 4, 8, 16 and 24 field channels.

Strip terminals

With strip terminals of DTU2300 support the interface between the I/O cards and the field wiring. To prevent the inadvertently connection to wrong type of terminal, the mechanical keying system helps I/O cards to avoid these failures.

Racks

With 5 different models of racks, the DTU2300's physical and electrical backboard provides a mounting to support and interconnect the power supplies, I/O cards and strip terminals. Further, racks also carry the address, data and power lines of the internal rail bus. Racks provide termination points for the LAN and field wiring cable shields; also it distributes the power to the all the cards.



Power Management System

Power management system is not only available to convert local AC or DC supplies to power the DTU2300 and provide field power for I/O cards, but also be able to manage the UPS function with software control links to CPU module internally. With power management system of DTU2300 the back up UPS battery can be efficiently increasing the service life by feature of definable discharge cycle time and discharge duration, short circuit protection for all powered branches, and cell cut off function under low limit voltage.

Fault Current Detection

The fault current detection with DTU2300 is a powerful measurement feature for power quality. Fault current detection not only provides the over current detection between phase to phase and phase to neutral, but also to detects over current direction. User can selects more than 10 types of standard protection curve, and also the multiple over current, time of over current, and parameter of MTA angle can be user defined by software

Synchronization Detection

In order to detect the synchronization AC power by DTU2300, the feature of synchronization detection is not only able to ,monitor the switching in load transformation, but also DTU2300 to detect the minimizing the error percentage between difference band in frequency, voltage magnitude and phase angle.

Power Quality Analysis

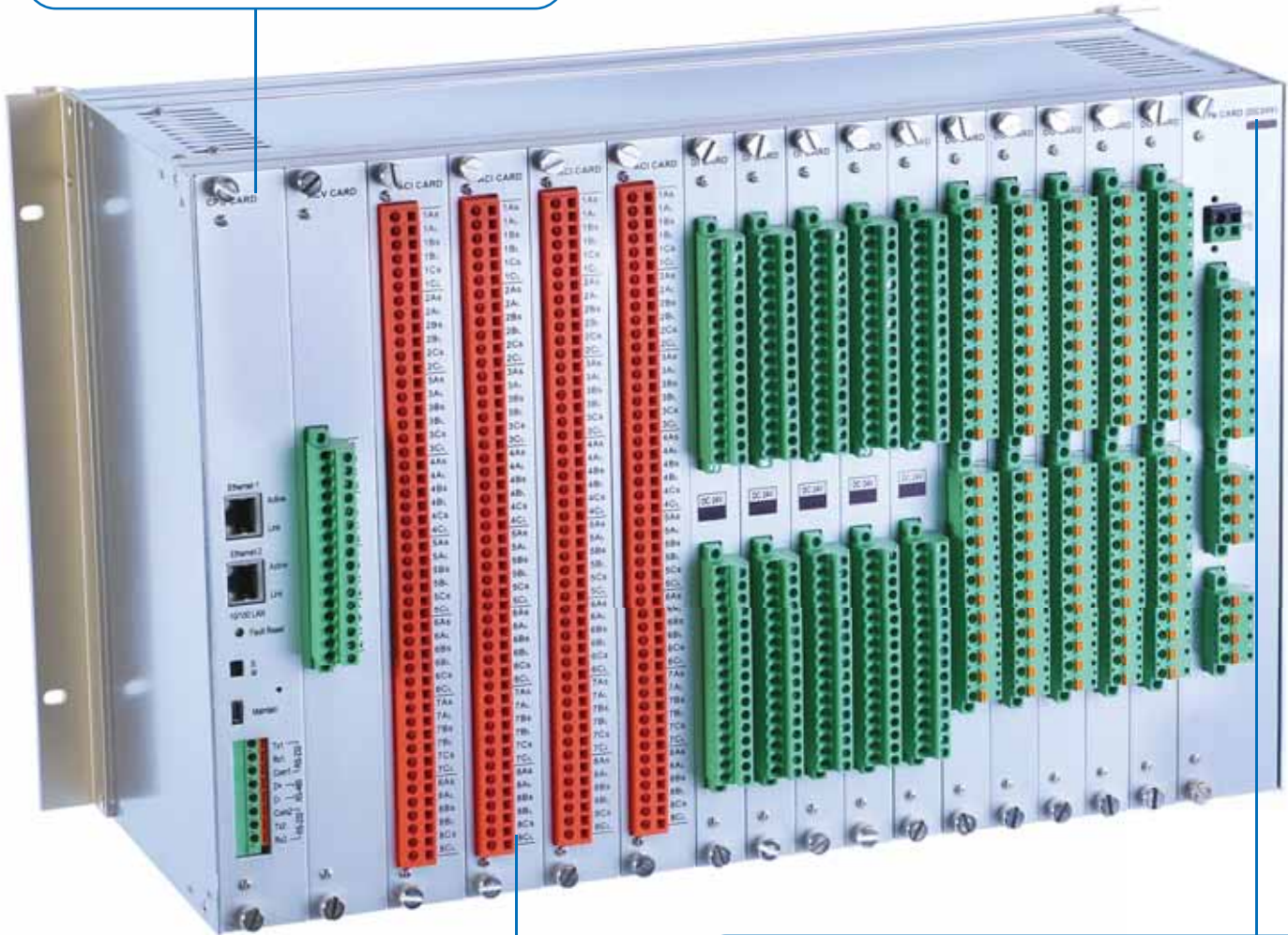
Power quality analysis is a specialized measurment feature DTU2300 supports Users for reliable power quality. As for a green energy concept , power events may result from power utilities system which influences by parameter of voltage, current and frequency. But to receive the information of unstable power event and analysis of power quality in advance, the DTU2300 provides Power quality analysis for which this feature by greatly reduce management costs and improve efficiency.

Distribution Terminal Unit

Processing module

CPU 32 bits dual Arms
Interface Standard Ethernet RJ-45 x 1 ;
RS-232 x 2 ; RS-485 x 1
Option Ethernet RJ-45 x 1
Protocol IEC 101
IEC 104
DNP 3.0
Modbus RTU
Event logger
Ring buffer

SOE 256
Fault current 256
System 256
I/O fetching and control
Central scanning to I/O bus
AI channels 108 maximum
DI bus 32 with 320 points
acknowledgment maximum
DO bus 16 with 160 points
controlling maximum



AC input configuration

Wiring and software setup
Detection (* = software composed)

Voltages / Bus

3U – 3 phase 4 wires Va, Vb, Vc, *V0
3U – 3 phase 3 wires *Va, *Vb, *Vc

Currents / Feeder

4I / Ia, Ib, Ic, I0 ; Ia, Ib, Ic, I0
3I / Ia, Ib, Ic ; Ia, Ib, Ic, *I0
3I / Ia, I0, Ic ; Ia, *Ib, Ic, I0
2I / Ia, Ic ; Ia, *Ib, Ic

DC input configuration

Definable scale counts setup
(AI with DC module)

Power module

Mode A Supporting DTU power only
Input DC 20-72V, 15W or AC 85-260V, 15VA
Mode B Power management with ups function control
Input DC 24V or DC 48V
(external load: 450W or 75W)

Power selection

Capacity according to dispatching branches
450W For DTU + modem + DI + cell charger +
breaker switching
75W For DTU + modem + DI + cell charger
(breaker switching by cell power)

Management

with software control link to CPU module internally
UPS function
Charge and discharge maintenance for back up cells
Definable discharge cycle time and discharge duration
Short circuit protection for all powered branches
Cell cut off function under low limit voltage
Alarms

DO module

Interface 16 relays to 8 pairs / module
Photo isolated drive 3KVrms isolation
10A / 250VAC / 30VDC ; 5A / 48VDC

Logic control

Check before execution with two step drive
Two's complementary command drive,
with noise immunity
Hardware assurance limit one DO
activation at any case

Output mode

Pulse output
Duration 50-65535ms, step 1ms

AI module

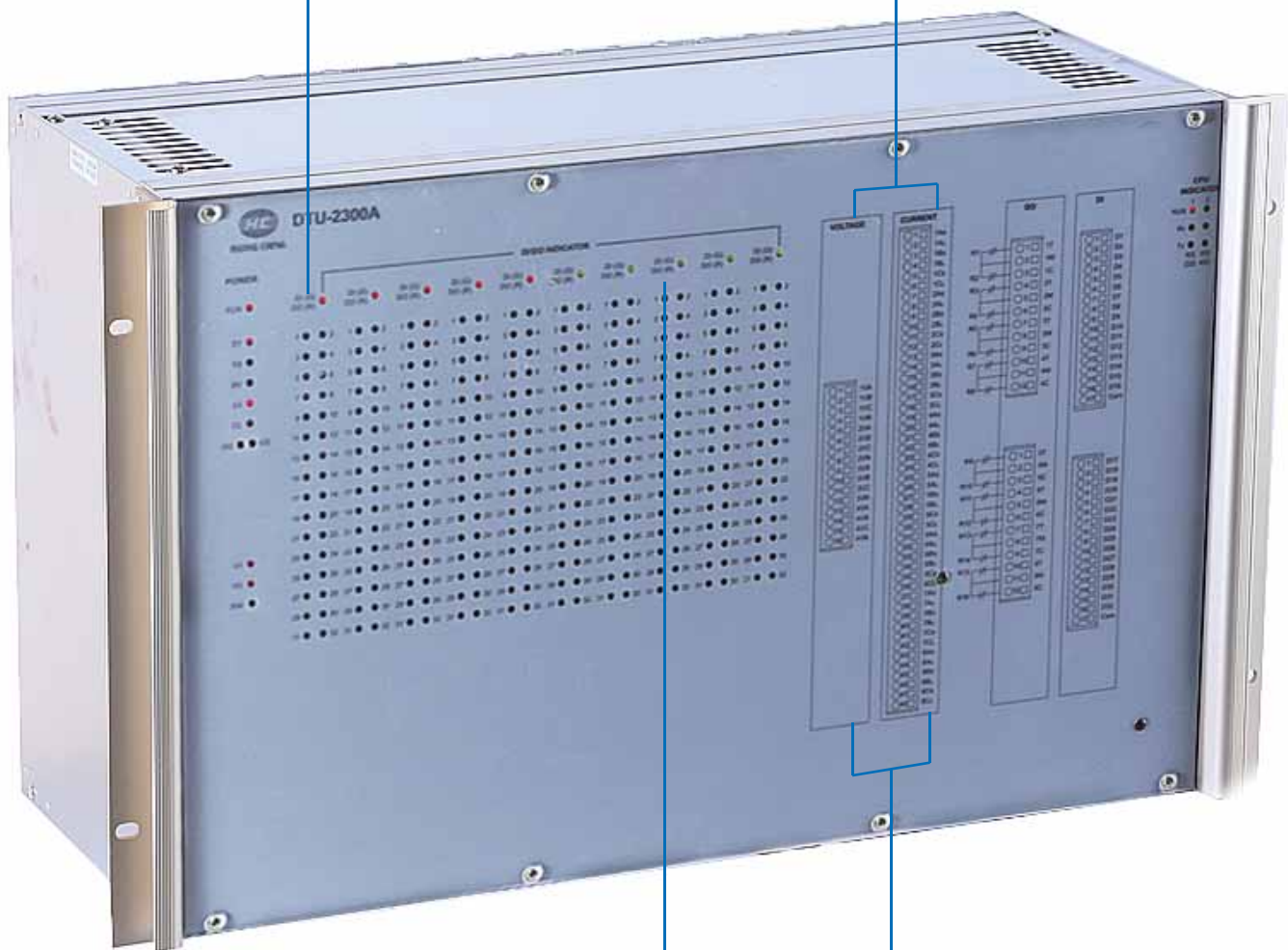
AC input mode

Voltages

Frequency 45-65 Hz
0-300V phase to neutral
0-520V phase to phase
Maximum over $\leq 1000\text{Vrms}$ 2 seconds
Input resistance $1\text{M}\Omega \pm 1\%$

Currents

CT 5A or CT 1A
Nominal range $\leq 2 \times \text{CT}$
Fault range $\leq 20\text{CT}$ non saturated



DI module

Interface 32 points / module
Exciting voltage 24V or
48V DC
Isolation, 3KVrms photo
isolated

SOE

Resolution 1ms
Debounce 5-255ms,
step 1m

$\leq 3\text{CT}$ continuous
 $\leq 25\text{CT}$ 2 seconds
 $\leq 50\text{CT}$ 1 seconds
 $\leq 100\text{CT}$ 0.5 seconds
Burden $\leq 0.1\text{VA}$ for 1 x CT input

DC input mode

Differential mode
4-20mA / 0-20mA / 0-10mA / 0-5mA / 0-1mA
1-5V / 2-10V / 0-10V / 0-5V / 0-1V
Input resistance
Voltage $\geq 1-10\text{M}\Omega$; current $\leq 100\Omega$

Distribution Terminal Unit

Bus frequency
0.05% of nominal frequency
Bus voltage (RMS)
0.25% of nominal voltage
Phase voltage Va, Vb, Vc
Line voltage Vab, Vbc, Vca

DC input mode
Differential mode
4-20mA / 0-20mA / 0-10mA / 0-1mA
1-5V / 2-10V / 0-10V / 0-5V / 0-1V
Input resistance
Voltage $\geq 1-10M\Omega$; current $\leq 100\mu A$
Bus frequency
0.05% of nominal frequency

Interface
16 relays to 8 pairs / module
Photo isolated drive 3KVRms isolation
10A / 250VAC / 30VDC
5A / 48VDC
Output mode Pulse output
Duration 50-65535ms, step 1ms

Feeder automation (FDIR)
Power system supervision
Power SCADA system

CPU 32 bits dual Arms
Interface
Standard Ethernet RJ-45 x 1;
RS-232 x 2; RS-485 x 1
Option Ethernet RJ-45 x 1
Protocol
IEC 103
IEC 104
DNP 3.0
Modbus RTU

Bus voltage (RMS)
0.25% of nominal voltage
Phase voltage Va, Vb, Vc
Line voltage Vab, Vbc, Vca
Currents (RMS)
0.25% of nominal CT, Ia, Ib, Ic, IO
Active power (watts)
0.5% of (nominal voltage x CT)

Currents / Feeder
4I / Ia, Ib, Ic, IO Ia, Ib, Ic, IO
3I / Ia, Ib, Ic Ia, Ib, Ic, IO
3I / Ia, Ib, Ic Ia, *Ib, Ic, IO
2I / Ia, Ic Ia, *Ib, Ic
DC input configuration
Definable scale counts setup

Reactive power (Var) 0.5% of (nominal voltage x CT)
Apparent power (VA) 0.5% of (nominal voltage x CT)
Active energy (WH) 0.5% of (nominal voltage x CT)
Reactive energy (VarH) 0.5% of (nominal voltage x CT)
Fault currents (RMS) 1% fs (fs = 20 x CT)
DCV / DCmA 0.1% fs

Voltages

Frequency 45-65 Hz
0-300V phase to neutral
0-520V phase to phase
Maximum over $\leq 1000V_{rms}$ 2 seconds
Input resistance $1M\Omega \pm 1\%$

Fault current detection
Phase and neutral fault with directional detection
12 inversed curves (ANSI, IEC, IEEE)
4 flexible curves
1 definite time
Current pick up 0.01CT to 20CT, step 0.01CT
Time delay multiple 1-500 of defined basic curves
MTA 0 to 359.9°, step 0.1°

Fault current detection
Phase and neutral fault with directional detection
12 inversed curves (ANSI, IEC, IEEE)
4 flexible curves
1 definite time
Current pick up 0.01CT to 20CT
Time delay multiple 1-100

AD Conversion
16 bits synchronized A-D converters
24 ADC for DTU-2300A
16 ADC for DTU-2300B / DTU-2300C
8 ADC for DTU-2300D / DTU-2300F

Synchronization detection
Switching in load transformation
Difference band in frequency,
voltage magnitude and phase angle

Interface
32 points / module
Exciting voltage 24V or 48V DC
Isolation 3KVRms photo isolated
SOE
Resolution 1ms
Debounce 5-255ms, step 1ms

Voltage dips
Voltage unbalances
(zero and negative sequence)
Flicker $\Delta V10$ or PST

High integration with expandable I/O capacity
Central control simplify I/O Module (free of CPU)
Option with power quality analysis IEC 61000-4-30
Harmonics, voltage dips, voltage unbalance, flicker

Power quality analysis (option)
IEC 61000-4-30 (only for DTU-2300C, D, F models)
Harmonic analysis, 1-17th
Voltage dips
Voltage unbalance (zero and negative sequence)
Flicker $\Delta V10$ or PST

Power quality analysis (option)
IEC 61000-4-30
(only for DTU-2300C, D, F models)
Harmonic analysis, 1-17th
Voltage dips
Voltage unbalance
(zero and negative sequence)
Flicker $\Delta V10$ or PST

AC input configuration
Wiring and software setup
Detection (* = software composed)
Voltages / Bus
3U - 3 phase 4 wires Va, Vb, Vc, *V0
3U - 3 phase 3 wires *Va, *Vb, *Vc

Interface 16 relays to
8 pairs / module
Photo isolated drive
3KVRms isolation
10A / 250VAC / 30VDC
5A / 48VDC
Logic control
Check before execution with
two step drive
Tov's command drive with
high noise immunity
Hardware assurance to
limit one DO
activation at any case
Output mode
Pulse output
Duration 50-65535ms,
step 1ms

I/O fetching and control
Central scanning to I/O bus
AI channels 108 maximum
DI bus 32 with 320 points
acknowledgment maximum
DO bus 16 with 160 points
controlling maximum



About HCE

HCE was established on September 3 1979. Our goal is to design and manufacture series products for all power systems. HCE always has high quality principles for best quality, best services and best technique skills by the approval of ISO9001/ISO9002. For over 20 years, HCE contributes and always strive on developing the most durable and stable products for the usage of all power systems. We have earned excellent customer feedbacks and marketing reputation from all over the world.

HCE has available products for both measuring instruments and power distribution systems for utilities and industries. We have developed various series products to match the various marketing demands. We truly believe that giving our customers the best service is the main purpose for HCE and also our long-term responsibility.

With spirited teamwork, our business has expanded to the oversea markets successfully. All HCE products are originally designed and manufactured (ODM). We are researching and developing new high-tech products continually in order to meet increasing demands for electricity. To improve business administration and quality assurance, we consistently run CWQC (company wide quality control) as strict step by step quality compliance for our production procedure that complies with ISO9001.

In order to increase product range and precede the business alliance strategy, we strive to open business channels and mutual trades. Our aim is to promote our high quality products with HCE brand to the world market by extending our technology and business worldwide as an international enterprise.



Models

Model	DTU-2300A	DTU-2300B	DTU-2300C	DTU-2300D	DTU-2300F
DIN Rack	6U 84T	6U 52T	6U 38T	6U 28T	6U 24T
Depth	200mm	200mm	200mm	200mm	200mm
Modules / slot	17	10	7	5	4
Bus	4 Max.	3 Max.	3 Max.	2 Max.	2 Max.
Feeders	24 (3U4I)	16 (3U4I)	8 (3U4I)	4 (3U4I)	4 (3U4I)
	27 (3U3I)	16 (3U3I)	8 (3U3I)	4 (3U3I)	4 (3U3I)
AI (points)	108	73	57	22	22
DI (points)	320 Max.	160 Max.	96 Max.	32	16
DO(relays)	160 Max.	80 Max.	48 Max.	16	6