We touch your electricity everyday!

CSEZEN-F-100-U

Advance Voltage Protection & Monitoring IED

DRAW-OUT ENCLOSURE

FAULT, EVENT DISTURBANCE RECORDER

DI/DO PROGRAMMABLE MATRIX

METERING PROTECTION

Catalog

C&S electric

PMD Division

CONTENT

1.0 Introduction

CSEZEN-F-100-U Series relays provide reliable and high performance protection.
The CSEZEN-F-100-U is a relay for AC voltage supervision with universal application; it protects the three phase network against over, under voltage, unbalance or earth faults in isolated networks. Beside the pure RMS value measurement of the line voltage the CSEZEN-F-100-U can detect the phase sequence, voltage unbalance and earth faults.

- Draw out enclosure have modular design
- Measurement & Protection
- DO Matrix Programmability
- Intelligent key for DO status, details of fault pickup & status of last fault occurred
- Suitable for Star & Delta configuration
- CSEZEN-F-100-U relays are equipped with self supervision function
- Last 20 Fault record (non-volatile memory) with time stamp
- Last 500 Event record (non-volatile memory) with time stamp
- SCADA Communication (Local & Remote)

2.0 Application

The CSEZEN-F-100-U relay has been designed for controlling, protecting and monitoring industrial, utility distribution networks and substations. They can also be used as part of a protection scheme for feeders, transformers and generators.

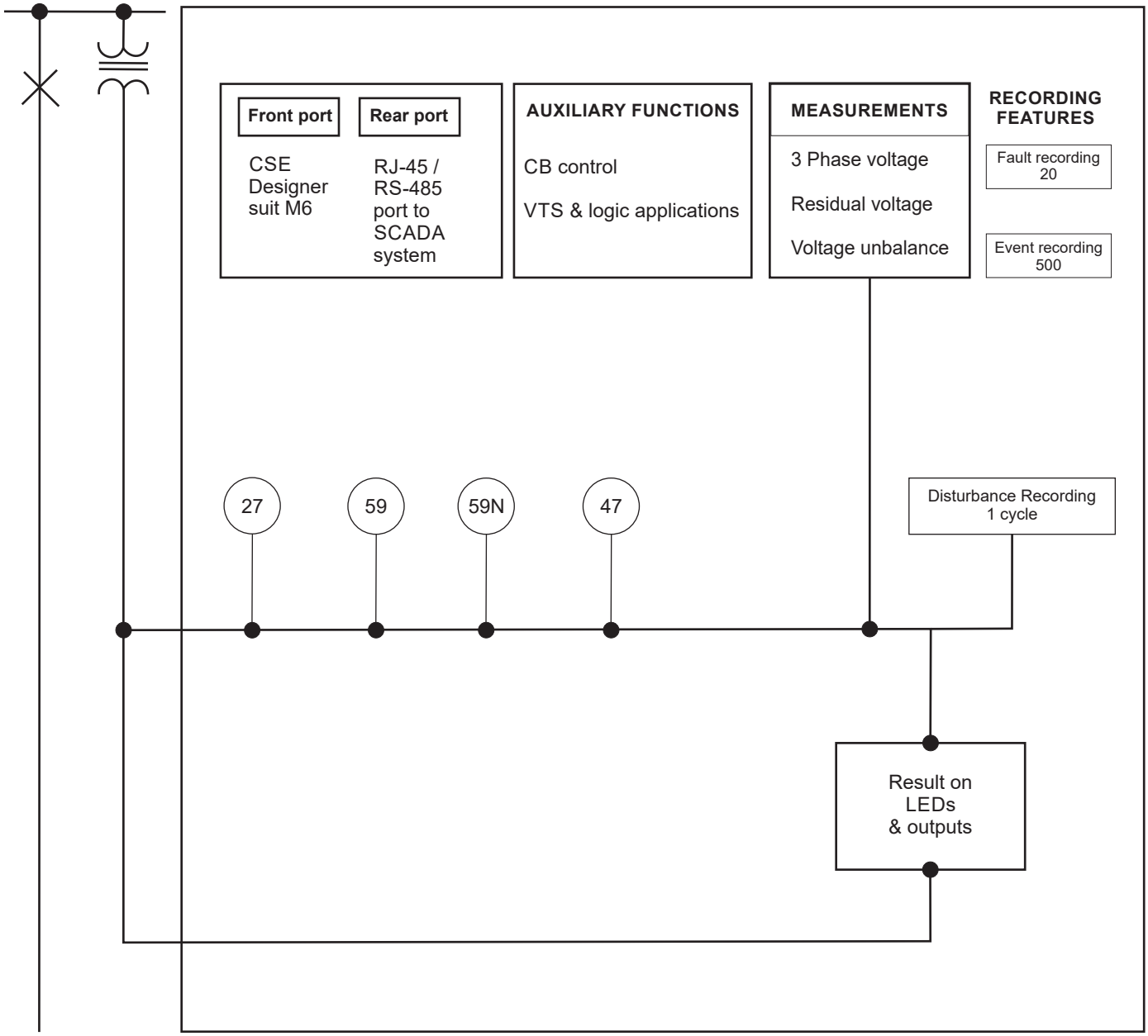
3.0 Protection Features

- Residual Voltage / Neutral displacement
- Over Voltage
- Under Voltage
- Positive Sequence over voltage
- Negative Sequence over voltage

4.0 Hardware

- Digital Signal Processor based numeric design
- Measures true RMS with DFT filter
- 4 Voltage Analog Input
- 8 Digital Outputs
- 8 Digital inputs
- 16 LEDs at Pickup & Trip on fault
- LAN-RJ45/RS-485/USB ports for Communication
- 16x2 Alpha numeric LCD
- 5 Push button on the front for HMI

5.0 Functional Diagram



CSEZEN-F-100-U Functional Diagram

6.0 Protection Functions

Voltage Protection

The relay is equipped with an independent over, 2 step over (U>, U>>) and under voltage supervision (U<, U<<)simultaneously with separately adjustable tripping values and delay times. Voltage measuring is 3-phase. In this process there is a continuous comparison of the line conductor voltages in case of a delta connection and of the phase voltages in case of a star connection with the preset limit Values.

a) Under voltage / Over voltage

For under / over voltage protections settings, Refer table 2.

Block on under voltage (UlossBlk) in case of power failure is user selectable. If it is enable then for <10% of Un (Power Failure) under voltage protections will be blocked. Protection Blocking is indicated by LED, if configured for Block functions.

b) Zero Sequence Over voltage (Neutral Displacement)

CSEZEN-F-100-U relays will operate from the zero sequence over voltage functions according to the VT configuration

VT configuration= EXTERNAL, then the [59N] will operate based on the residual voltage measured on the relay terminals (Refer figure 6 for connection diagram)

VT configuration = INTERNAL, then [59N] will operate based on the zero sequence voltage

$\overrightarrow{U_0} = 1/3 |(\overrightarrow{U_{L1}} + \overrightarrow{U_{L2}} + \overrightarrow{U_{L3}})|$ calculated internally.

c) Negative Sequence over voltage

This function is based on the negative-sequence component of the voltage, which is calculated internally and displayed on the screen of the front panel: It is designed to detect any voltage unbalance condition.

$\overrightarrow{U_2} = 1/3 |(\overrightarrow{U_{L1}} + a^2\overrightarrow{U_{L2}} + a\overrightarrow{U_{L3}})|$

d) Positive Sequence Under voltage

This function is based on the positive phase sequence component of the voltage, which is calculated internally.

$\overrightarrow{U_1} = 1/3 |(\overrightarrow{U_{L1}} + a\overrightarrow{U_{L2}} + a^2\overrightarrow{U_{L3}})|$

7.0 Data Acquisition Functions

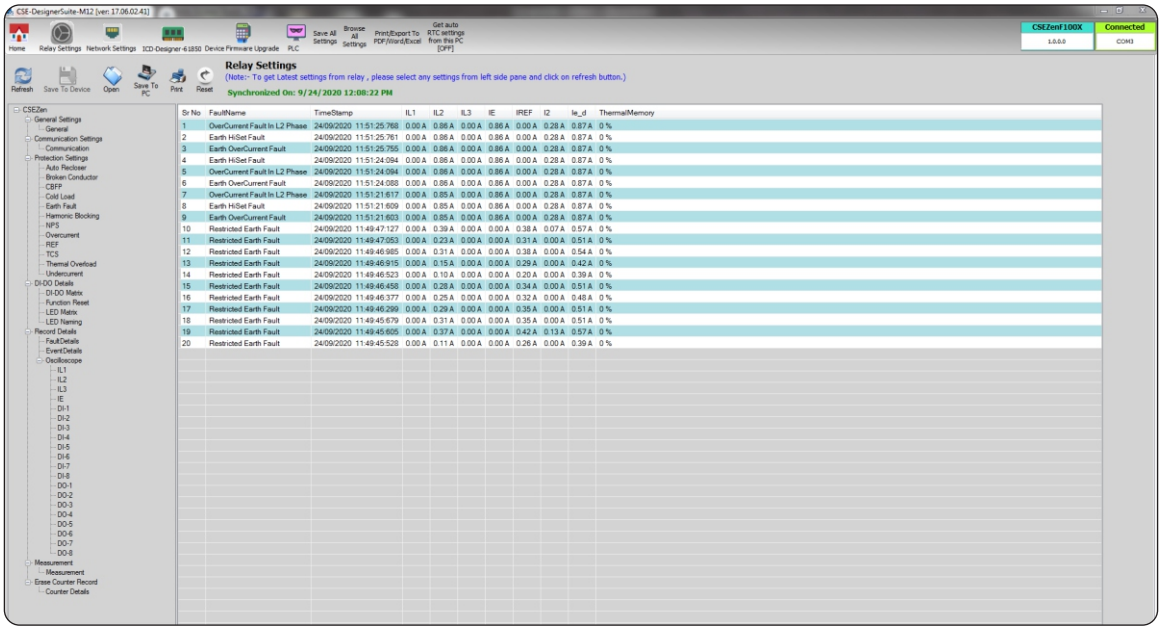
Measurement

- 3 Phase Star Voltage
- Residual Voltage
- 3 Phase Delta Voltage
- Negative / Positive Sequence Voltage

8.0 Fault Record

CSEZEN-F-100-U records last 20 faults in its non volatile memory with its time stamp. Each record has the following information:

Fault Format		
UL1	:	XX.XXV
UL2	:	XX.XXV
UL3	:	XX.XXV
U0	:	XX.XXV
UL12	:	XX.XXV
UL23	:	XX.XXV
UI31	:	XX.XXV
HR MIN	:	HH:MIN
SEC Ms	:	Sec: mSec
DATE	:	DD:MM:YR
F-TYPE	:	Type of fault

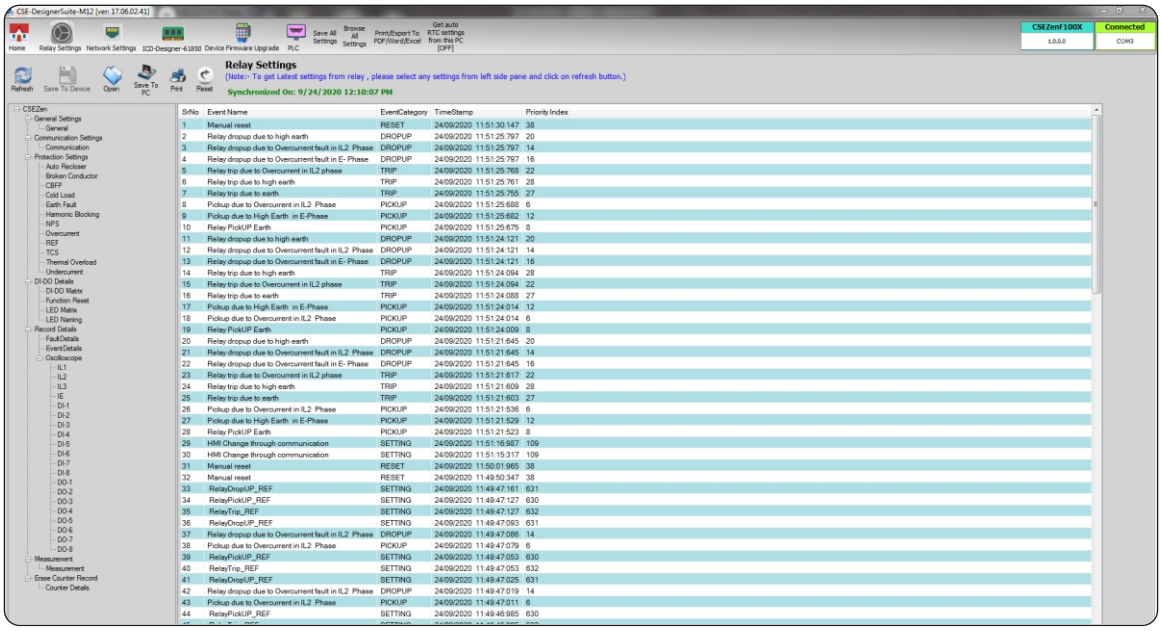


Fault Data recording on PC software

9.0 Event Record

The unit stores in non volatile memory the last 500 events with its time stamp. When the available memory space is exhausted, the new event automatically overwrites the oldest event, which can be retrieved from a PC.

The user can view event records via the front USB interface software.

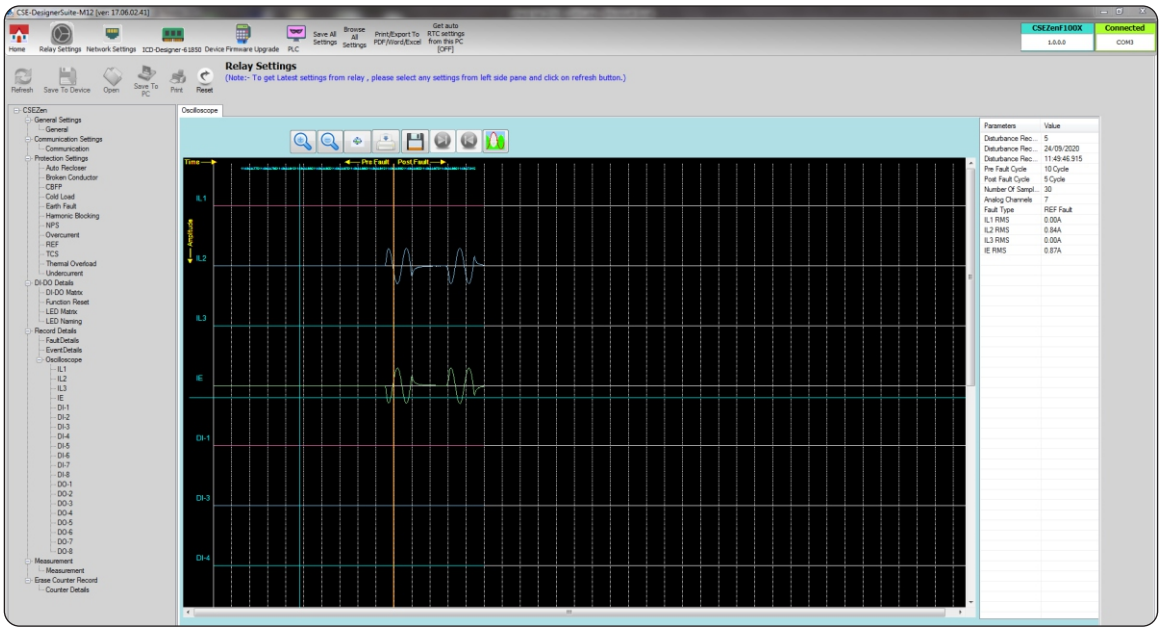


Event Data recording on PC Software

10.0 Disturbance Record

The CSEZEN-F relay has an oscillograph data recorder with the following characteristics:

- Oscilloscopic recording can trigger on Pickup or on trip or via DI i.e. change from pre-fault to post-fault stage. It is programmable.
- Each record comprises the samples from max. 4 analog signals and the status of maximum 8 digital inputs and maximum 8 digital outputs. There will be 30 samples per cycle.
- Relay saves maximum 1200 cycles, and the number of cycles per record is programmable which limits the maximum no. of records possible to store in the relay (for example: if 40 cycles are selected, then there will be maximum 30 records of 40 cycles each).
- The pre-fault and post-fault cycles are programmable.
- Records are in the non volatile memory.
- The records are transferred to PC using USB interface. The data is graphically displayed and can be taken on printer.
- Record 1 is always latest record. 2nd record is older than 1st..... and so on.
- Disturbance record is available in comtrade format as per IEC60255-24.

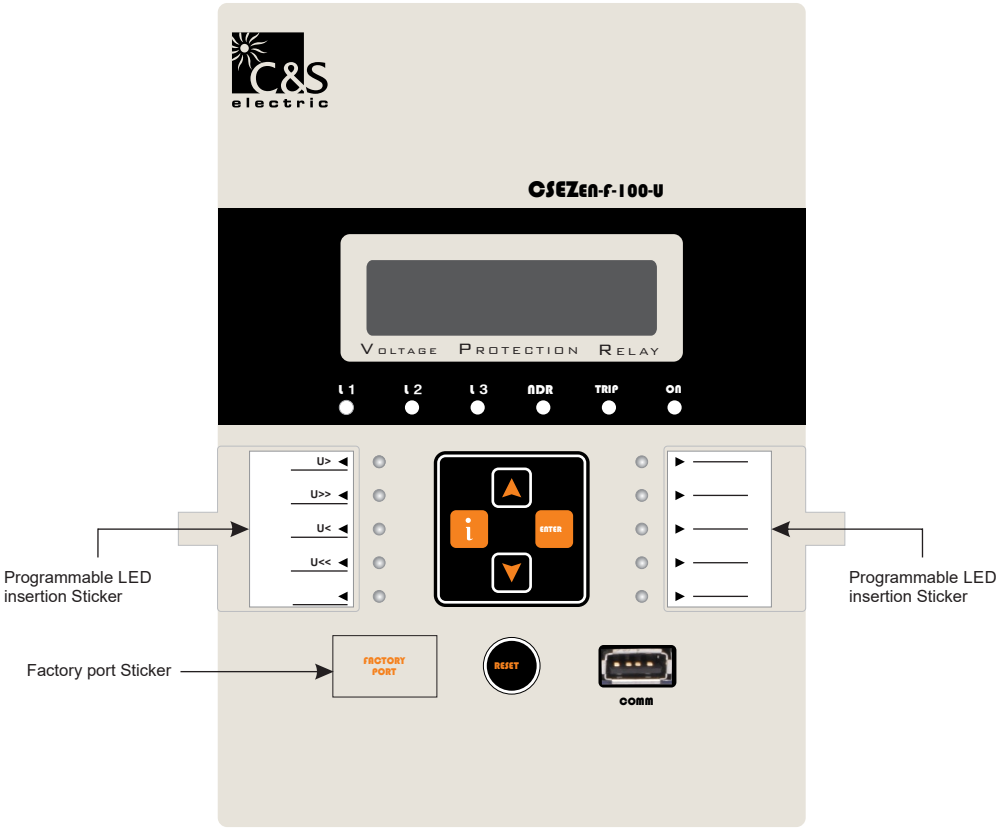


Oscilloscope recording on PC software

11.0 Human Machine Interface

It comprises of bright LCD display

- Four push switches for setting values of normal tripping characteristics and other operations for local access.
- One RESET push switch.
- LEDs for pickup or tripping on fault and event in any phase.



Keys	Manual Key
i	is used as intelligent key to see the details of last fault and Relay status.
ENTER	is used as a ENTER key.
RESET	is used to manual reset (after pressing for 2 sec).
▲	is used to scroll in upward direction.
▼	is used to scroll in downward direction.

Output Contacts

Max. No. of digital outputs	:	8 (DO1, DO2 .....DO8) (1 change over)
Type of outputs	:	Relay
Programmable (DO Assignment)	:	Yes
Relay reset type	:	Programmable (Auto/Manual)

Input Contacts

Max. No of digital inputs	:	8 (DI1, DI2..... DI 8)
Type of inputs	:	AC/DC Voltage
Programmable (DI Assignment)	:	Yes

12.0 Communication (Local & Remote)

The unit has:

- 1 Front USB port for direct connection to a PC
- 1 Rear RS-485 communication port
- Rear Ethernet port (RJ-45) for IEC-61850
- The ethernet port can be optionally replaced with Dual Fiber optics port

Dual Rear Communication (RS-485)

The choice of protocol for the rear RS-485 communication port is based on ordering information. The user can choose either MODBUS or IEC-60870-5-103 protocol.

Front Communication (USB)

The entire setting including protection parameter setting for both group, Fault, Event & Disturbance record are available on A type USB (female) interface with CSE LIVELINK with saving & printing option. This unit also has Front-end Live Link simulation support for testing of relay even without any three phase injection source.

IEC-61850 Communication

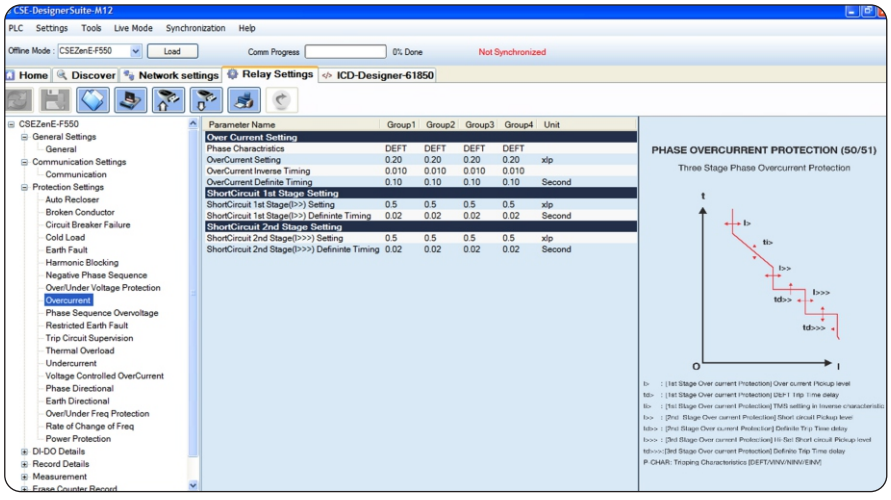
Our IEDs now support several enhanced features of the **Edition-2** of **IEC-61850 standard**, such as peer-to-peer communication between the relays, known as GOOSE messaging, buffered and unbuffered reporting, settings change as well as support for all control models as described in IEC 61850-7-2 Ed2.

Further, **Edition-2** introduces the concept of Goose subscription and monitoring via the LGOS logical node supported by our IEDs.

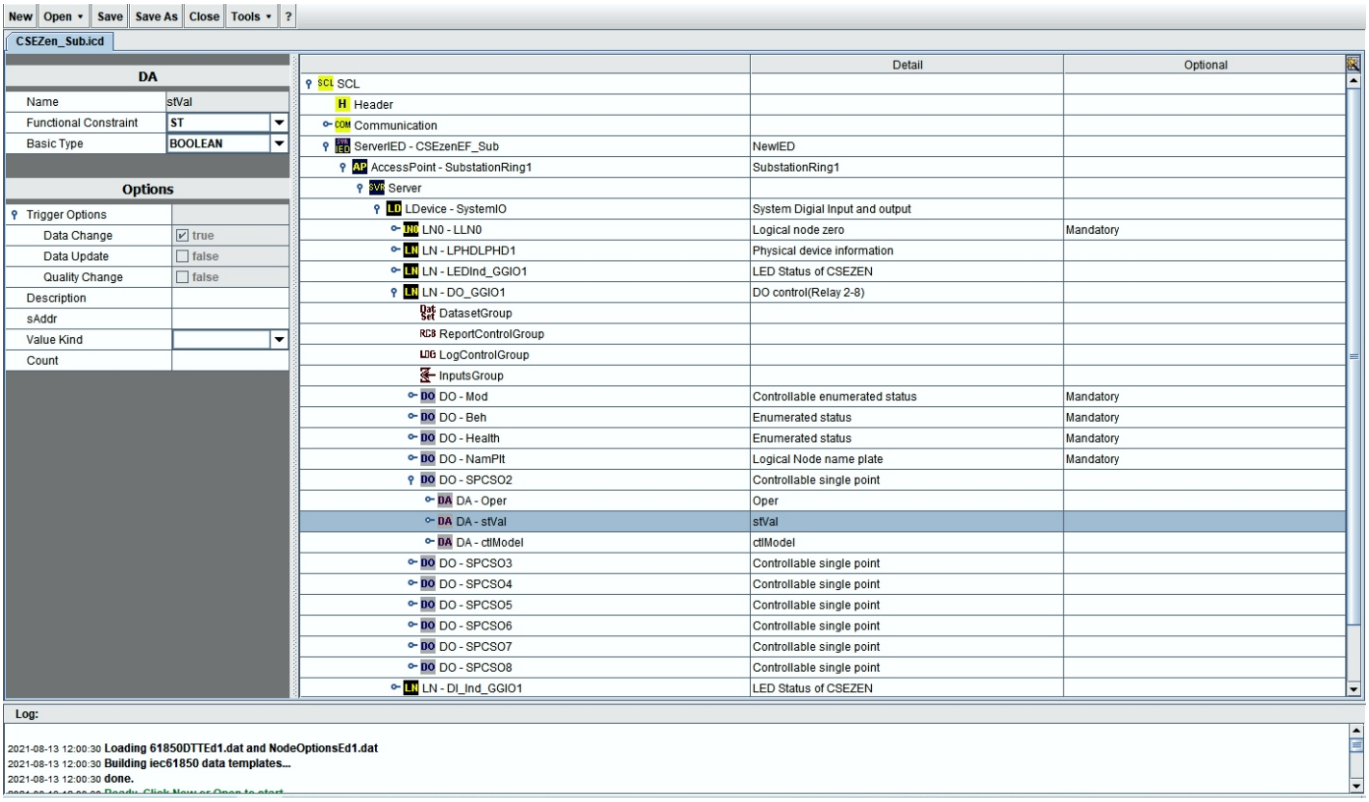
The IEC 61850 and a companion standard, the IEC 62439 defines two additional requirements by way of the **Parallel Redundancy Protocol** (PRP) and **High Availability Seamless Redundancy** (HSR) protocol to attain zero packet loss. While PRP achieves network redundancy by packet replication over two independent networks operating in parallel, HSR is realized using a ring topology to transmit packets in either direction. CSEZEN-F series relays **support both PRP as well as HSR over dual redundant RJ-45 ports** (*Model dependent, please speak with our sales team for models that support HSR/PRP).

All relay models that support HSR/PRP also offer enhanced cyber security features and comply with cyber security requirements.

The IEC 61850 interface is configured with familiar, user-friendly CSE Designer M12 software.



CSEZEN IEDs come with a powerful Software suite to help reconfigure IEC61850 settings during installation

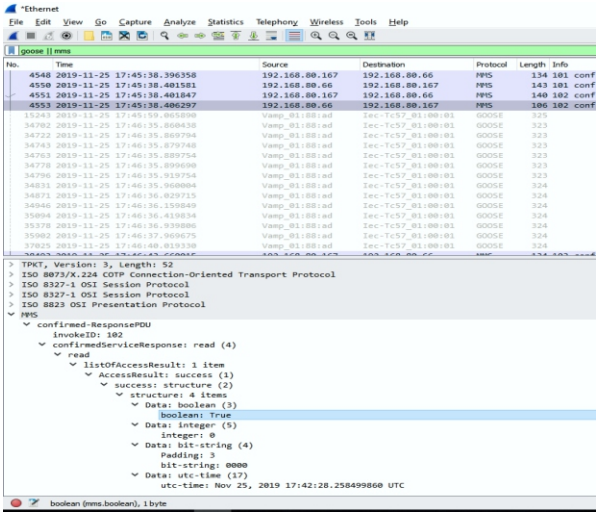


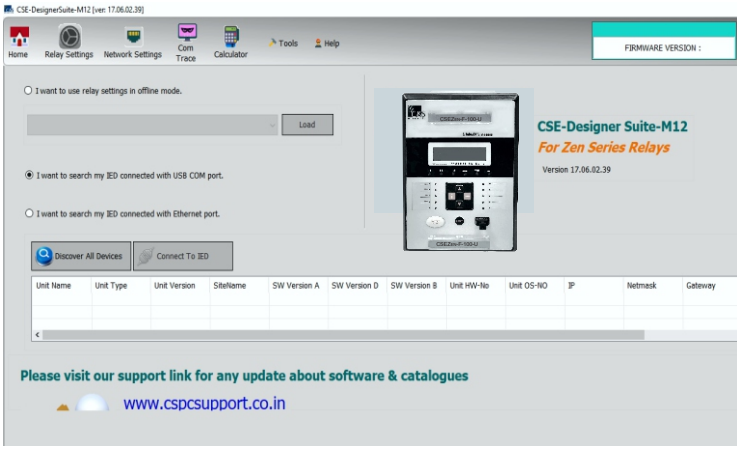
IEC 61850 Features

CSEZEN IEDs come with a powerful Software suite called `IED Assistant` for easy configuration of IEC61850 related settings during installation or for troubleshooting

CSEZEN IEDs support the following IEC-61850 features:

- Full Buffered and Unbuffered Reports on all optional fields triggered on General Interrogation or Data Change.
- GOOSE Publish and Subscribe on all IED parameters.
- Time Synchronization with Time Zone Support
- Supports all control schemes as defined by the standard.
- PLC based programming & logic equations for GOOSE parameters
- GOOSE parameter mapping to LED & Dos
- Support for metering parameters (Analog values)





13.0 Setting Ranges

Active Group Setting

Parameters	Display	Setting Range		Step Size	Default Setting
		Min	Max		
Active Group	ACTIVE	Group1	Group2	1	Group1

(Table-1)

(1) Refer following formula for IDMT characteristics for over/under voltage

Very Inverse $t = \frac{TMS}{(V/V_s) - 1}$

Where
t = Operating time in seconds
TMS = Time multiplier setting
V = Applied Input Voltage
Vs = Relay Setting Voltage

Note: This equation is only valid for V/Vs ratio < than 0.95 (under voltage) of ratio > 1.1 (over voltage)

Under Voltage / Over Voltage Setting

Parameters	Display	Setting Range		Step Size	Default Setting
		Min	Max		
Under voltage characteristics	U<char	DEFT	IDMT		DEFT
Blocking on loss of voltage	UlossBlk	Enable	Disable		Disable
Under voltage threshold setting	UV-THRE	5%Un	100%Un	1%Un	10%Un
Under voltage pickup setting	U<Pkup	5%Un	120%Un	1%Un	Disable
Under voltage TMS setting	U<Ti	0.05	2	0.01	0.05
Under voltage definite time	U<Td	0.03 sec	20.00 sec	0.01 sec	0.03 sec
Under voltage hi-set pickup setting	U<<Pkup	5%Un	120%Un	1Un	Disable
Under voltage definite time	U<<Td	0.03 sec	20.00 sec	0.01 sec	0.05 sec
Over voltage characteristics	U>char	DEFT	IDMT		DEFT
Over voltage pickup setting	U>Pkup	20%Un	170%Un	1%Un	Disable
Over voltage TMS setting	U>Ti	0.05	2	0.01	0.05
Over voltage definite time	U>Td	0.03 sec	20.00 sec	0.01 sec	0.05 sec
Over voltage hi-set pickup setting	U>>Pkup	20%Un	170%Un	1%Un	Disable
Over voltage definite time	U>>Td	0.03 sec	20.00 sec	0.01 sec	0.05 sec

(Table-2)

U0 / U1 / U2 Setting

Parameters	Display	Setting Range		Step Size	Default Setting
		Min	Max		
Neutral displacement pickup setting	ND>Pkup	2%Un	50%Un	0.5%Un	Disable
Neutral displacement characteristic	ND>Char	DEFT	IDMT	-	DEFT
Neutral displacement TMS setting	ND>Ti	0.05	2	0.01	0.05
Neutral displacement definite time	U0>Td	0.03 sec	20.00 sec	0.01 sec	0.05 sec
Positive sequence voltage pickup setting	U1<Pkup	10%Un	100%Un	1%Un	Disable
Positive sequence voltage definite time	U1<Td	0.03 sec	10.00 sec	0.01 sec	0.10 sec
Negative sequence voltage pickup setting	U2>Pkup	10%Un	100%Un	1%Un	Disable
Negative sequence voltage definite time	U2>Td	0.03 sec	10.00 sec	0.01 sec	0.10 sec

(Table-3)

DO Assignment

Parameters	Display	Default Setting
Under voltage protection	U<	Auto/Manual
Under voltage hi set protection	U<<	Auto/Manual
Over voltage protection	U>	Auto/Manual
Over voltage hi set protection	U>>	Auto/Manual
Neutral displacement voltage protection	ND>	Auto/Manual
Positive sequence voltage protection	U1<	Auto/Manual
Negative sequence voltage protection	U2>	Auto/Manual
Remote Trip-1	RmtTp1	Auto/Manual
Remote Trip-2	RmtTp2	Auto/Manual
Remote Trip-3	RmtTp3	Auto/Manual
Remote Trip-4	RmtTp4	Auto/Manual
Self supervision	SlfSup	Auto/Manual

(Table-4)

DI Assignment

Parameters	Display	Default Setting
Remote Reset	RmtRst	Auto/Manual
Under voltage blocking (1st Stage)	U<Blk	Auto/Manual
Under voltage blocking (2nd Stage)	U<<Blk	Auto/Manual
Neutral Displacement voltage protection	ND>	Auto/Manual
Positive sequence voltage protection	U1<	Auto/Manual
Negative sequence voltage protection	U2>	Auto/Manual
Oscilloscope toggling	OscTg	Auto/Manual
Remote Trip-1	RmtTp1	Auto/Manual
Remote Trip-2	RmtTp2	Auto/Manual
Remote Trip-3	RmtTp3	Auto/Manual
Remote Trip-4	RmtTp4	Auto/Manual
Over voltage blocking-1st stage	U>Blk	Auto/Manual
Over voltage blocking-2nd stage	U>>Blk	Auto/Manual

(Table-5)

Erase Counter Record

Parameters	Display	Setting Range		Step Size	Default Setting
		Min	Max		
Erase Events	EventsErase	NO	YES	1	NO
Erase Faults	FaultsErase	NO	YES	1	NO
Erase Oscilloscope Record	Erase Osc Record	NO	YES	1	NO
Trip counter	TrpCnt	NO	YES	1	NO

(Table-6)

LED Assignment

Parameters	Display	Default Setting
Under voltage protection	U<	Auto/Manual
Under voltage hi set protection	U<<	Auto/Manual
Over voltage protection	U>	Auto/Manual
Over voltage hi set protection	U>>	Auto/Manual
Neutral displacement voltage protection	ND>	Auto/Manual
Positive sequence voltage protection	U1<	Auto/Manual
Negative sequence voltage protection	U2>	Auto/Manual
Remote Trip-1	RmtTp1	Auto/Manual
Remote Trip-2	RmtTp2	Auto/Manual
Remote Trip-3	RmtTp3	Auto/Manual
Remote Trip-4	RmtTp4	Auto/Manual
Relay Blocking	CBlk	Auto/Manual
Relay Pickup	CmPk	Auto/Manual
Relay Trip	CmTr	Auto/Manual
Relay Healthy LEd	HLed	Auto/Manual

(Table-7)

Function Reset

Parameters	Display	Default Setting
Under voltage protection	U<	Auto/Manual
Under voltage hiset protection	U<<	Auto/Manual
Over voltage protection	U>	Auto/Manual
Over voltage hi set protection	U>>	Auto/Manual
Neutral displacement voltage protection	ND>	Auto/Manual
Positive sequence voltage protection	U1<	Auto/Manual
Negative sequence voltage protection	U2>	Auto/Manual
Remote Trip-1	RmtTp1	Auto/Manual
Remote Trip-2	RmtTp2	Auto/Manual
Remote Trip-3	RmtTp3	Auto/Manual
Remote Trip-4	RmtTp4	Auto/Manual

(Table-8)

Common Setting

These are the settings common for all the protections:

Parameters	Display	Setting Range		Step Size	Default Setting
		Min	Max		
Nominal frequency	FREQ(Fn)	50 Hz	60 Hz	-	50 Hz
Phase selection	PHASE	1	3	-	1
PT ratio	PTRatio	1	9999	1	1
Wire configuration	Wire confg	STAR	DELTA	-	star
Neutral displacement	NeutDisp	EXTRNL	INTRNL	-	EXTRNL
Fault Message Setting	[F]Stats	Disable	Enable	-	Disable
Programming Logic controller	PLC	Disable	Enable	-	Disable
Service Mode	SerMod	Disable	Enable	-	Disable

(Table-9)

Rear Communication (RS-485) (* Model dependent)

Description		Default Setting
Baud rate selection (programmable)	9600 / 19200 / 38400 bps	19200 bps
Parity selection (programmable)	Even / Odd / None	None
Stop bit	1 Bit	1 Bit
Data bit	8 Bit data	8 Bit data
Remote address (programmable)	247	1
Cable required for Interface	Two wire twisted shielded cable	------

* For MODBUS : Remote Address Setting Range is 1 - 247
& For IEC 103 : Remote Address Setting Range is 1 - 254

(Table-10)

Front USB Communication

Protocol	CSE Proprietary Protocol: available with front software
Baud rate	19200 bps
Cable required for Interface	USB cable type (A to A)

(Table-11)

IEC 61850 Communication (* Model dependent)

Specifications	Default Setting
Max. no. of GOOSE inputs & outputs	64
Max. no. of clients	6

(Table-12)

Measuring Input

Rated Data	
Rated voltage (Vn)	110V (In Star configuration it will be 63.5V)
Rated frequency (Fn)	50Hz / 60Hz

(Table-13)

Trip Contact Rating

Contact rating	
Contact relay	Dry contact Ag Ni
Make current	Max. 30A & carry for 3S
Carry capacity	8A continuous
Rated voltage	250V AC / 30V DC
DC Current Carrying Capacity	8A@30VDC / 0.3A@110VDC/ 0.2A@220VDC
Breaking characteristics	
Breaking capacity AC	1500VA resistive 1500VA inductive (PF=0.5) 220V AC, 5A(cos phi=0.6)
Breaking capacity DC	135V DC, 0.3A (L/R=30ms) 250V DC, 50W resistive or 25W inductive (L/R=40ms)
Operation time	<10ms
Durability	
Loaded contact	10,000 operation minimum
Unloaded contact	30,000 operation minimum

(Table-14)

Trip Time Accuracy

Parameters	Accuracy
Trip time accuracy for protections	±5% OR ±30mSec OR inaccuracy in Trip Timing in reference to ±2% error in measured voltage

(Table-15)

Measurement Accuracy

Parameters	Range	Frequency Range	Accuracy
Voltage	5-170%Un	50-60Hz	Less than±2%

(Table-16)

Auxiliary Supply

Rated auxiliary voltage UH	For L Model	18V-150V DC ±10%
	For H Model	80V-280V AC / 90V-300V DC ±10%
	For U Model	40V-280V AC / 18V-300V DC ±10%
Rated supply for digital input	Normal Voltage UN For H Model	40V-280V AC (Active)
		40V-300V DC (Active)
		<25V AC (Inactive)
		<25V DC (Inactive)
	Normal Voltage UN For L Model	18V - 150V DC (Active)
		<10V DC (Inactive)
	Normal Voltage UN For U Model	>22V DC onwards
		>50V AC onwards
Power consumption	Quiescent approx. 3W	Operating approx. <7W

(Table-17)

Common Data

Dropout ratio	> 96%
Relay reset time	30 ms
Minimum operating time	30 ms
Transient overreach at instantaneous operation	±5 %

(Table-18)

Date & Time setting

Parameters	Display	Setting Range		Step Size	Default Setting
		Min	Max		
Hour	HOUR	0	23	1	---
Minute	MIN	0	59	1	---
Second	SEC	0	59	1	---
Date	DATE	1	31	1	---
Day	DAY	SUN	SAT	1	---
Month	MONTH	1	12	1	---
Year	YEAR	0	99	1	---

(Table-19)

Disturbance Record

These are the settings for Oscilloscope recording:

Parameters	Display	Setting Range		Step Size	Default Setting
		Min	Max		
Oscilloscope recording selection	OSC. RECORD	NO	YES	-	NO
Pre-fault cycle	PRE CYCLE	002C	298C	1C	002C
Post-fault cycle	POST CYCLE	002C	298C	1C	002C
Triggering mode	TRIGGER MODE	PK-UP	PK-UP/TRIP/DI/ Anyone	-	PK-UP

(Table-20)

14.0 Specification Table

Function	ANSI	CSEZEN-F-100-U
Voltage Analog input	---	4
Under voltage	27	✓
Over voltage	59	✓
Voltage unbalance	47	✓
Residual voltage	59N	✓
Positive Sequence over voltage	---	✓
Negative Sequence over voltage	---	✓
Digital input / Digital Output	---	8 / 8
Fault Record	---	20
Event Record	---	500
Disturbance Record	—	✓
Alpha numeric LCD Display	---	16x2
LEDs for Pickup & Trip on fault	---	6
Assignable LEDs	---	10
Draw out Enclosure	---	✓
Front Communication	---	✓
Rear Communication *		
MODBUS on RS-485	---	✓
IEC:60870-5-103 on RS-485	---	✓
IEC:61850 Single RJ-45 port Ed-1	---	✓
IEC:61850 PRP Dual RJ-45 port Ed-2	---	✓
Rated voltage	---	✓
Auxiliary Supply *		
L = 18V - 150V DC	---	✓
H = 80V - 280V AC / 90 - 300V DC	---	✓
U=40V - 280V AC / 18V - 300V DC	---	✓

(Table-21)

15.0 Standards

Type Test			
F1	Functional Tests	Internal Design	Performance in line with Specification & Standards Pickup/Drop down/Power consumption in
		Specifications & IEC60255-6 IEC60255-3	Voltage/Aux Supply/Trip timing accuracy: OV / UV / NDR

Climatic Test			
C1	Temperature Dry Cold (Relay operational)	IEC 60068-2-1	-20 deg C, 96 hours
C2	Temperature Dry Cold Transportation & Storage	IEC 60068-2-1	-25 deg C, 96 hours
C3	Temperature Dry Heat (Relay operational)	IEC 60068-2-2	55 deg C, 96 hours
C4	Temperature Dry Heat Transportation & Storage	IEC 60068-2-2	70 deg C, 96 hours
C5	Damp Heat Test (Relay operational)	IEC 60068-2-18	95% @ +55 / +25 deg C, 6 cycle (12hr + 12hr each)

Enclosure			
C6	Enclosure	IEC 529	Front IP54 (Dust 5x + Water x4)

Mechanical Test

Relay Operational			
M1	Vibration response / Endurance test	IEC 60068-2-6	Class I Vibration response (Relay operational) 10Hz~150 Hz - peak displacement 0.035 mm below 58/60 Hz, 0.5 g above, 1 sweep cycle in each axis Vibration endurance (Relay de-energised) 10 Hz~150 Hz 1g, 20 sweep cycles in each axis
M2	Shock Response / Withstand Test	IEC 60255-21-1	Class I Shock response (Relay operational) 5g 11mS 3 pulse in each axis Shock withstand (Relay de-energised) 15g 11mS 3 pulses in each axis
M3	Bump	IEC 60255-21-1	Bump (Relay de-energised) 10g 16mS 1000 pulses in each axis
M4	Seismic	IEC 60255-21-3	Class I Method A single axis sine sweep 1 Hz~35 Hz–below 8/9 Hz 3.5 mm peak displacement horizontal axis, 1.5 mm vertical axis above 8/9 Hz 1g horizontal, 0.5 g vertical 1 sweep cycle in each axis

Electrical Test			
E1	Insulation Resistance >100MΩ	IEC 60255-5	500V DC, 5 sec between all terminals & case earth, between terminals of independent circuits including contact circuits and across open contacts
E2	DC & AC Supply Voltage (Relay operational)		IEC 60255-6 Voltage range, upper & lower limit continuous withstand, ramp up & down over 1 minute
E3	Voltage Dips, Short Interruptions & Voltage variations immunity (Relay operational)	IEC 1000-4-11	IEC 60255-113 Dips & 3 Interruptions at 10 sec intervals of duration between 10mS and 500mS at zero crossings & at other points on wave Variation: 100% to 40% over 2s, hold for 1s, return to 100% over 2s
E4	Ripple in DC supply (Relay operational)	IEC 60255-11	12% AC ripple
E5	Dielectric Test (Relay de-energised) No breakdown or flash over Test voltage 45~65 Hz sinusoidal or with DC voltage at 1.4x the stated AC values	IEC 60255-5	2.0 KV @ 1min All circuit to Earth / Between IP & OP
E6	High Voltage Impulse (Relay de-energised)	IEC 60255-5	5 kV peak 1.2/50uS, 0.5 J-3 positive, 3 negative between all terminals to case earth between independent circuits
E7	VT Input Thermal Withstand		1.5xVn, continuous
E8	CT Input Thermal Withstand		250xIn half wave 100xIn for 1 second 30xIn for 10 second 4xIn continuously
E9	Contact performance & endurance tests	IEC 60255-14,15 IEC 60255-1	

Electro-magnetic Compatibility			
R1	Electrical fast Transient/Burst (Relay operational)	IEC 60255-22-4 IEC 61000-4-4	Class IV- ±4.0 kV All Circuits. Pulse 5/50nsec/Duration 15msec/ Period: 300msec/Pulse Freq: 5KHz / 2KV at I/O
R2	HF Disturbance Test (Oscillatory Waves) 1 MHZ Burst (Relay operational)	IEC 60255-22-1	Class III Longitudinal 2.5 kV peak, 2sec between independent circuits & case earth
R3	Electrostatic Discharge (Relay operational)	IEC 60255-22-2 IEC 61000-4-2	Class III 8kV air discharge, 6KV contact No of Discharge : 10 both polarities at 1 sec intervals
R4	Conducted Disturbance RF fields (Relay operational)	IEC 61000-4-6 IEC 60255-22-6	0.15 to 80 MHz (Level-3) Severity Level 10V RMS + sweeps 0.05-0.15 MHz & 80-100 MHz
R5	Radiated RF E-M field immunity test (Relay operational)	IEC 60255-22-3 IEC 61000-4-3	Class III Test method A + sweep 80-1000 MHZ or IEC 1000-4-3 80-1000 MHZ severity 10 V/m 80% modulated 1 kHz
R6	Surge Immunity capacitively coupled (Relay operational)	IEC 61000-4-5 Class 5 Test level 4 IEC 60255-22-5: 2008 Latest: IEC 60255-26:2013	Short circuit combination wave generator 1.2 uS/50 uS open circuit repetition rate 1 per minute Power supply, CT & VT circuits – 4kV common mode 2 Ohm source 2kV differential mode 12 Ohm source
R7	Power Frequency Magnetic Field (Relay operational)	IEC 61000-4-8	100 A/m for 1 minute in each of 3 axes
R8	Conducted & Radiated RF Interference Emission (Relay operational)	EN55011 IEC 60255-25	CISPR11/ Class A
R9	Power Frequency, conducted common mode	IEC 1000-4-16 IEC 60255-22-7	D.C. to 150 kHz Test Level 4 300V at 16 2/3 Hz and 50 Hz

16.0 Recommended Terminal Lugs Specifications

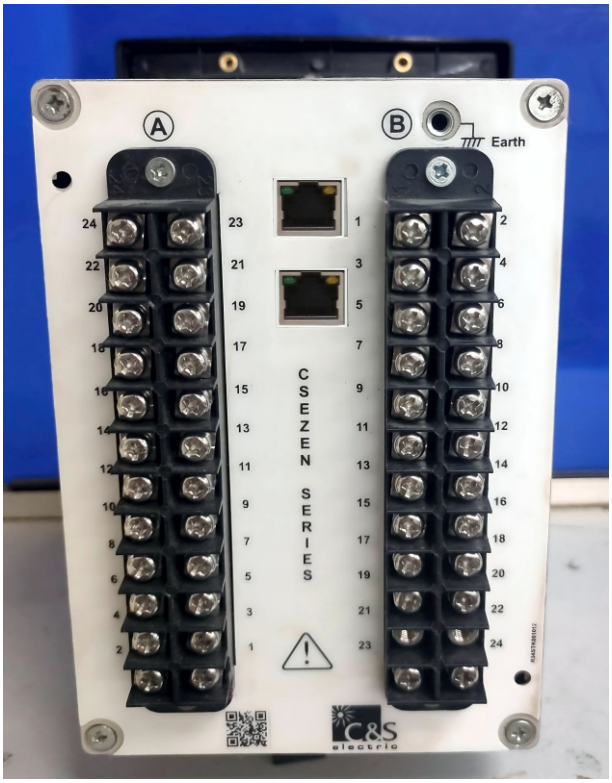
Term Blocks	Type/Cable Specifications
Current Inputs	Ring Type lug / 2.5mm^2 or 4 mm^2 control cable
Auxiliary Supply	Pin Type lug / 1.5 mm^2 / 2.5 mm^2 control cable
Rear Comm. Port	Pin Type lug / 1.5 mm^2 / 2.5 mm^2 control cable
Front Comm. Port	USB, Type - A to A
Binary Input	Pin Type lug / 1.5mm^2 / 2.5mm^2 control cable
Binary Output	Pin Type lug / 4.0mm^2 control cable
Earth Connections	Ring Type / 2.5mm^2 or 4 mm^2 contact cable

Cable required for Front USB Communication (Type A to A)

Additional Accessories
(Not a part of standard supply)

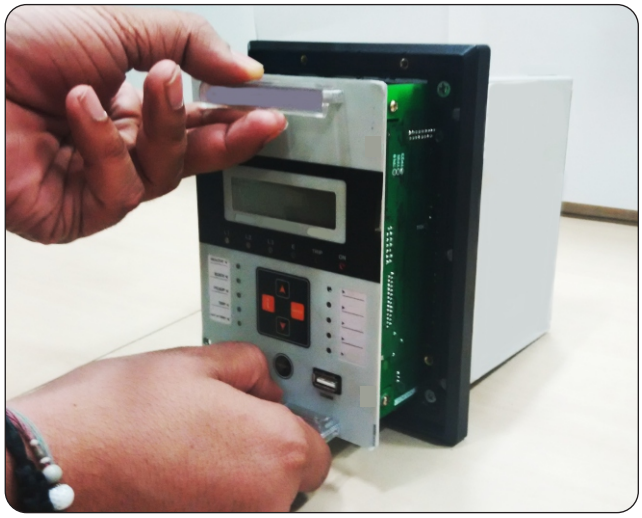
Back view of the Relay

(Model dependent)

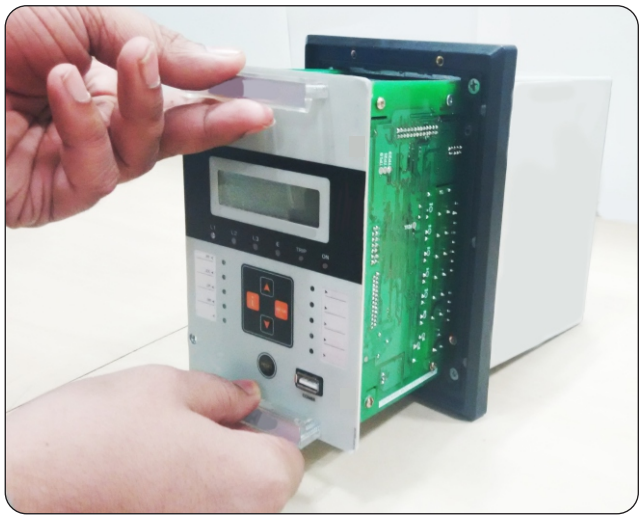


17.0 Draw out process of the Relay

First Open the screw fitted with Bezel using the appropriate screw driver then hold the Eject Handle.



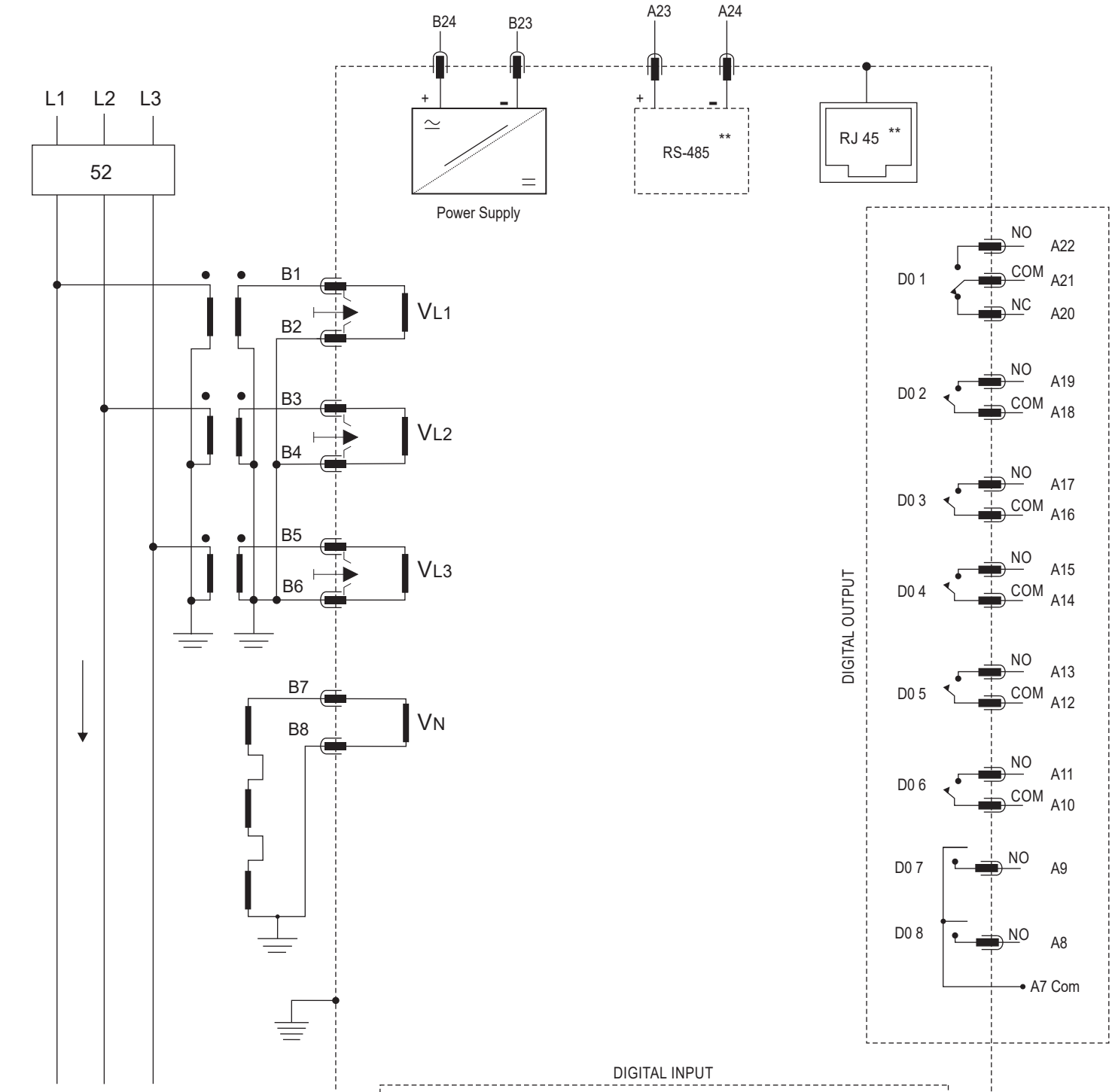
Use the Eject handle to bring out the Relay from the enclosure as shown in the left image.

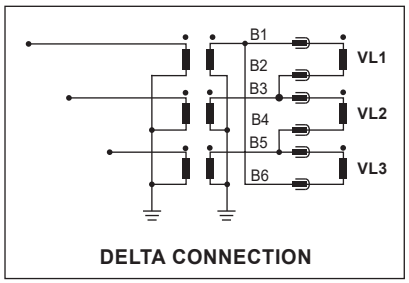


Bring out the Relay gently by dragging it outside, extra pressure can be the cause of relay damage.

Similarly while bringing in the Relay, Handle should be in uplift condition.

18.0 Connection Diagram

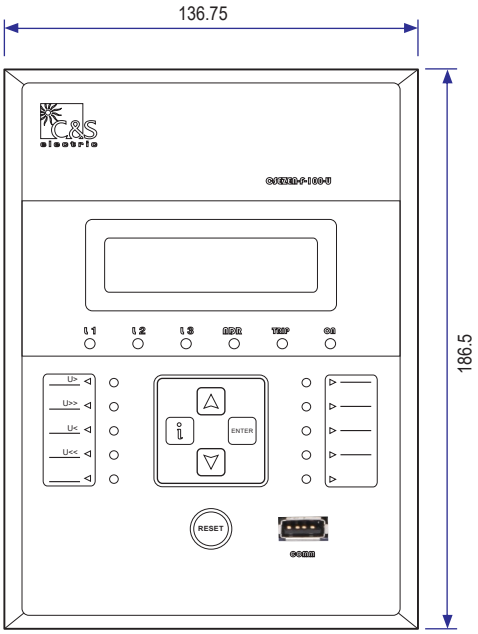




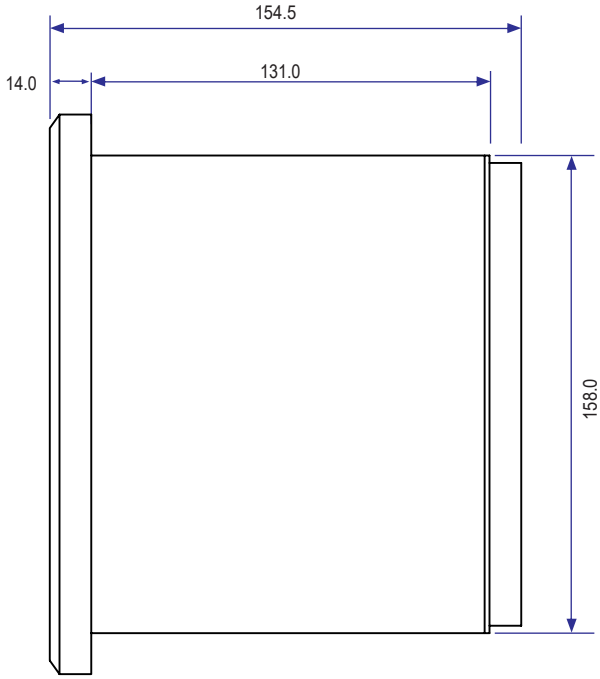
All the dim are in mm (Gen. Tol ± 1.0mm)

19.0 Dimensional Details

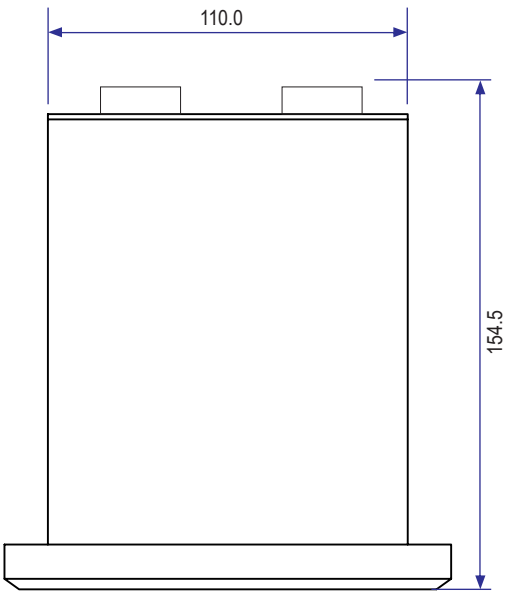
Front View



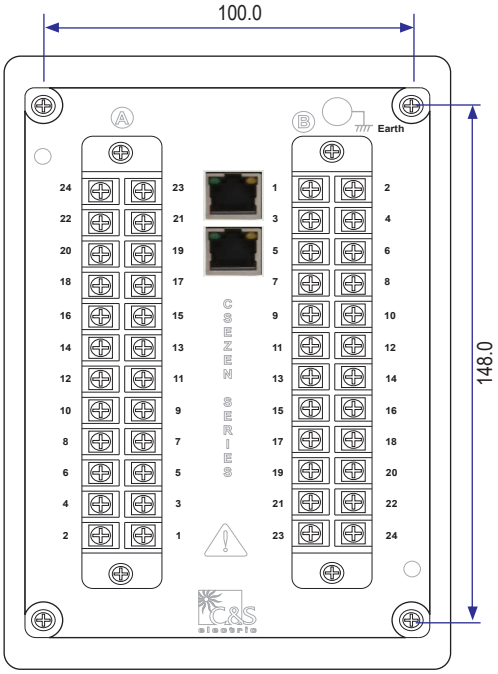
Side View



Top View

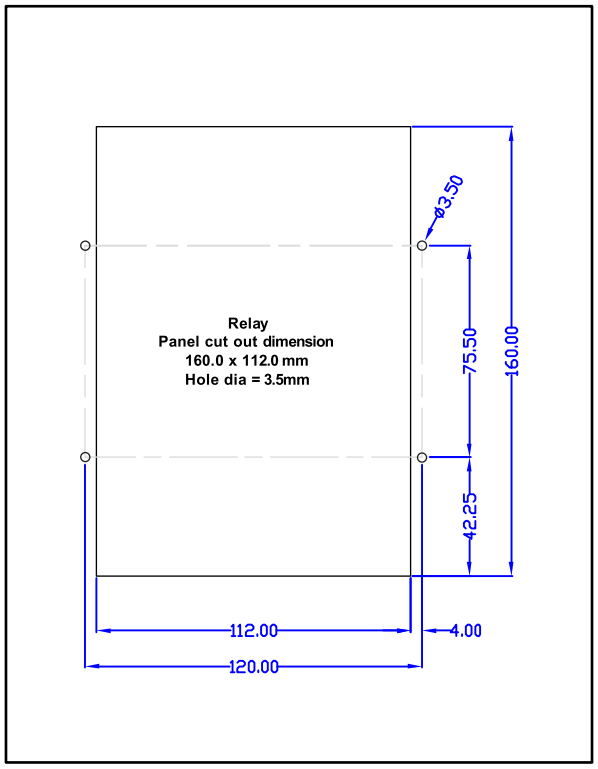


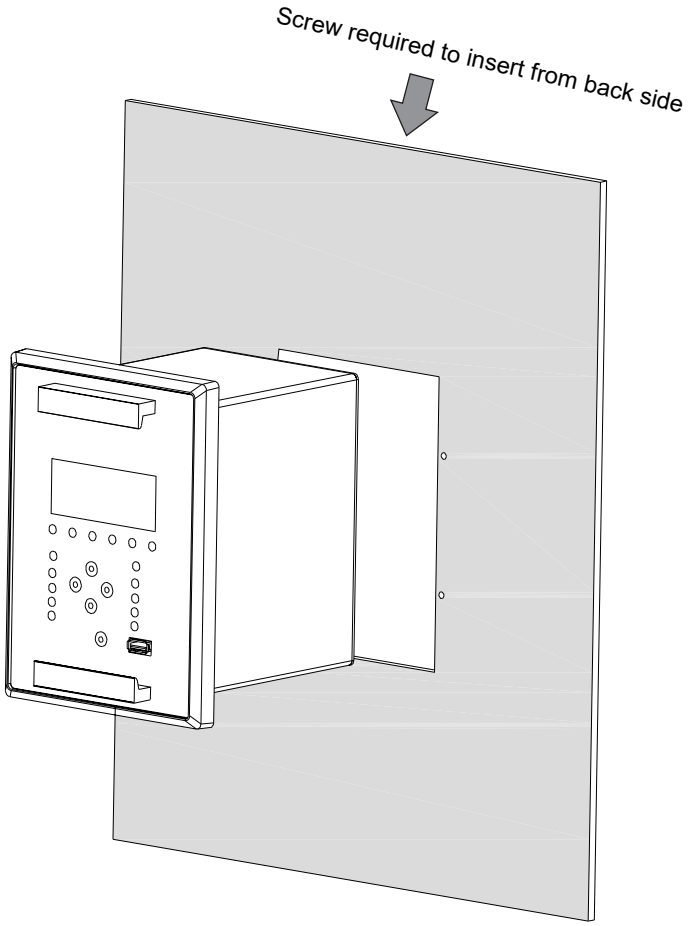
Back View



20.0 Panel Mounting Details

Panel cut out Dimension: Height x Width=160 x 112mm
Screw : M3, Qty : 04 Nos.





21.0 Ordering Information

CSEZEN-F-100-U - 1 - X - X - X

Rated Voltage	
1	110V
2	400V

Rear Communication Protocol	
M	MODBUS on RS-485
I 103	IEC 60870-5-103 on RS-485
I 650	IEC 61850-Single RJ-45 Port-Ed-d
Ed2	IEC 61850 PRP-Dual RJ-45 port-Ed-2

Enclosure Type	
D	Draw-out enclosure

Auxiliary Supply	
L	18V - 150V DC
H	80-280V AC / 90-300V DC
U	40V-280V AC / 18V-300V DC

Issue Date : 31.07.2024
Rev. No : 01
Rev. Date : 01.10.2024

Technical Question or After-sales Service

Customer Center Quick Response Service, Excellent Technical Support

1800 572 2012

NOTE

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C&S reserves the right to change the design, content or specification contained in this, without prior notice.

Revision History

S.No.	Rev.No.	Details	Date
01	01	Include DI & LED Assignment table, change in Function Reset Table on page 13/14	24.9.24