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CSENEX-I

Intelligent Measuring and Protection Device

CSENEX
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CSENEX
Series



Catalogue

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1) Introduction

CSENEX Series offers a compact Multi-functional Over-current protection solution for Feeder, Generator, Motor & Transformer segment.

CSENEX-I Family of protective relays are numeric relays that provides multi protection and monitoring with reliable and fast protection solution in a single unit.

In this family of CSENEX series, the CSENEX-I is an advanced feeder protection solution which has fast, sensitive and secure protection for feeder internal & external faults.

CSENEX-I offers different model based features to cover the wide range of user.

2) Features

- ❖ 1A & 5A rated CT input (programmable).
- ❖ Three phase time over-current protection.
- ❖ Draw out with self CT shorting.
- ❖ Three phase instantaneous protection.
- ❖ Earth time over-current and earth instantaneous over current.
- ❖ Circuit breaker failure detection.
- ❖ Trip circuit supervision.
- ❖ Event recorder.
- ❖ Fault recorder.
- ❖ Disturbance recording.
- ❖ DI/DO programmable matrix.
- ❖ Protection blocking through DI for coordination.
- ❖ Communication (Local & Remote).

3) Application

The CSENEX-I relays have 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.

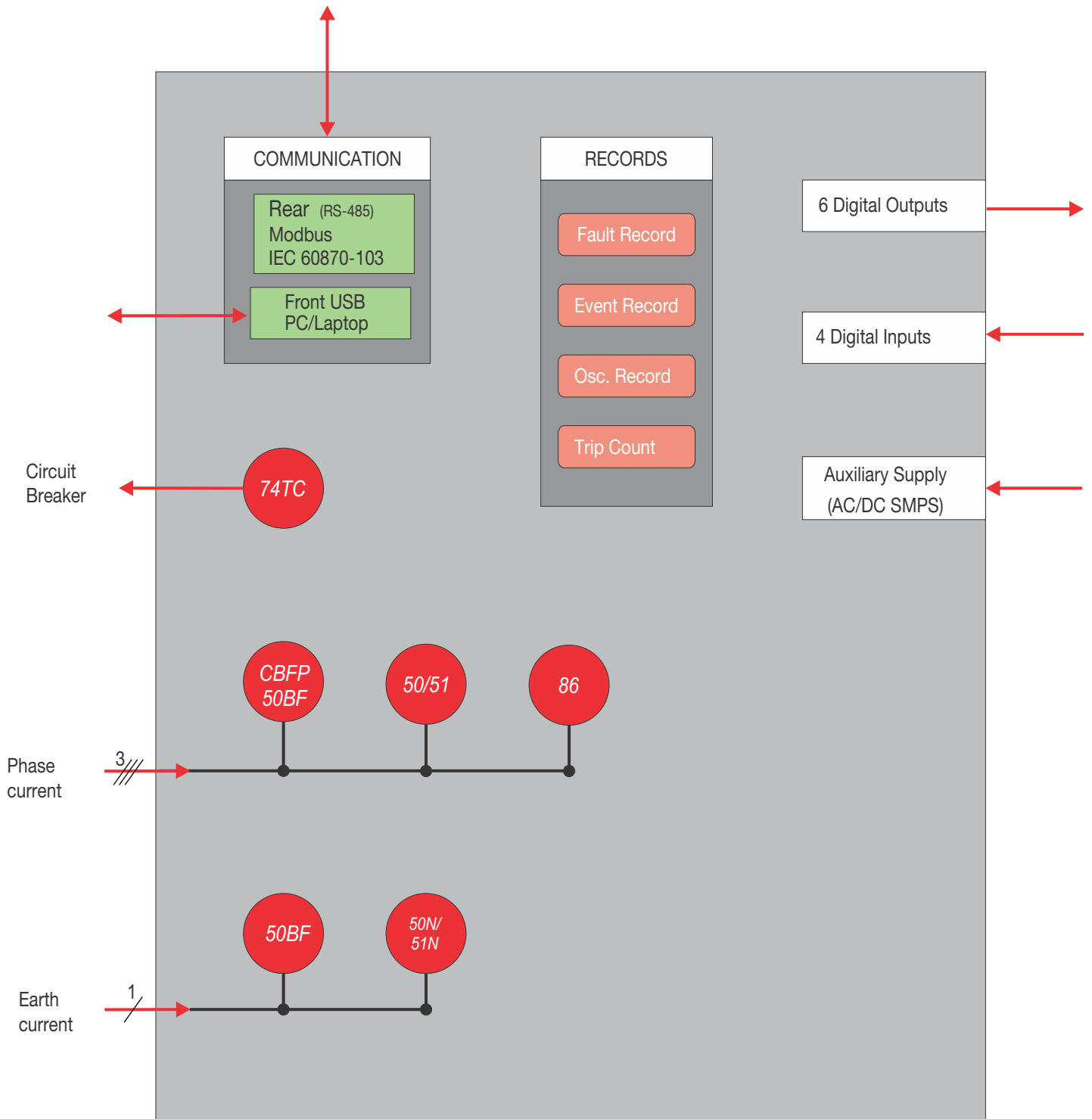
4) Hardware

- ❖ Digital Signal Processor based numeric design.
- ❖ Measures true RMS with DFT filter .
- ❖ 4 Current analog inputs for phase & earth fault current.
- ❖ 4 Digital Inputs.
- ❖ 6 Digital Outputs.
- ❖ 16 x 4 Alpha-numeric LCD.
- ❖ RS-485 & USB communication.
- ❖ 1 A & 5A common current terminal and programmable.

5) Protection Features

- ❖ Three phase time over current protection (51).
- ❖ Three phase instantaneous protection (50).
- ❖ Earth time over-current (51N).
- ❖ Earth instantaneous over-current (50N).
- ❖ Circuit breaker failure protection (50BF)
- ❖ Trip circuit supervision (74TC)

6) Functional Diagram



(Figure 1)

Protection Function

Three Phase Over-current Protection (50/51)

The independent two stages are available for phase fault protection. For $I >$ the user may independently select definite time delay or inverse time delay with different type of curves. The second Hi-Set ($I >>$) stage can be configured with definite time only.

Earth Fault Protection (50N/51N)

The independent two stages are available for earth fault protection. For first stage ($I_e >$) the user can select definite time delay or inverse time delay with different type of curves. The second Hi-Set ($I_e >>$) stage can be configured with definite time only.

Trip Circuit Supervision (74TC)

This feature continuously supervises trip circuit of both pre closing and post closing conditions in circuit breaker. It detects tripping mechanism failure like circuit breakage contact degeneration in wires, contacts and coils.

Note: Trip counter is incremented on the basis of getting trip command from relay and not on the basis of external mechanism (circuit breaker) operation.

Harmonic Restrain

Harmonic setting is disable by default. Phase/Earth Harmonics can be Blocked/Unblocked & time setting can also be edited through MMI. If the Pickup current has %harmonics above the set value of Harmonic, the protection will blocked for the harmonics blocking time .Tripping occurs according to the higher time setting i.e. if the harmonics time setting is greater it will trip according to the harmonics time setting otherwise according to the fault time setting.

Circuit Breaker Failure Protection (50 BF)

The Circuit Breaker Failure Protection is based on supervision of phase and earth currents after tripping events. The test criterion is whether all phase currents have dropped to less than 5% of rated within CBFP time setting. If one or more of the phase currents have not dropped to specified current within this time, Circuit Breaker Failure is detected and the assigned output relay is activated.

Cold Load Pickup

This function aims to avoid non-desired trips in the following situation: after being the line de-energized for a period of time and re-energized later, the load exceed the protection setting without the presence of a fault. This may be due to the fact that the “off” period of all the loads (furnaces, heaters, coolers etc.) is elapse and they are all connected at the same time, producing a strong inrush current in the line, but which can be supported within certain time. This phenomenon can occur not only at the moment of the breaker manual closing, after having remained open for a certain time, but also with the breaker permanently closed due to the operation of another upstream breaker.

What the function does is detecting when those conditions are given and changing the tripping settings during a programmable time.

The function is activated when the current in the 3 phases is below 0.08A, then the programmed time starts to run to determine that the load is “cold” (this time can be 0, what means that any circuit breaker opening could lead to the cold load situation). Once that time has expired and the current has not exceed again 0.15A, the protection usual setting (Group1) values are replaced by the cold load pickup ones (Group2). When any of the phase current exceed 0.15A a counter with programmable time starts, during which the setting are the cold load pickup ones (Group2). When expiring this time, the settings are again the usual ones (Group1). For settings Refer Cold Load Pickup Table in Setting Ranges.

7) Fault Recording

CSENEX-I records last 10 faults in its non volatile memory with it's time stamp. Each record has the following information:
fault Format

[F] IL1 : 00.00A
[F] IL2 : 00.00A
[F] IL3 : 00.00A
[F] Ie : 00.00A
HOUR MIN : HH:MM
SEC mSEC : Sec:mSec
F-TYPE : FAULT TYPE

Where

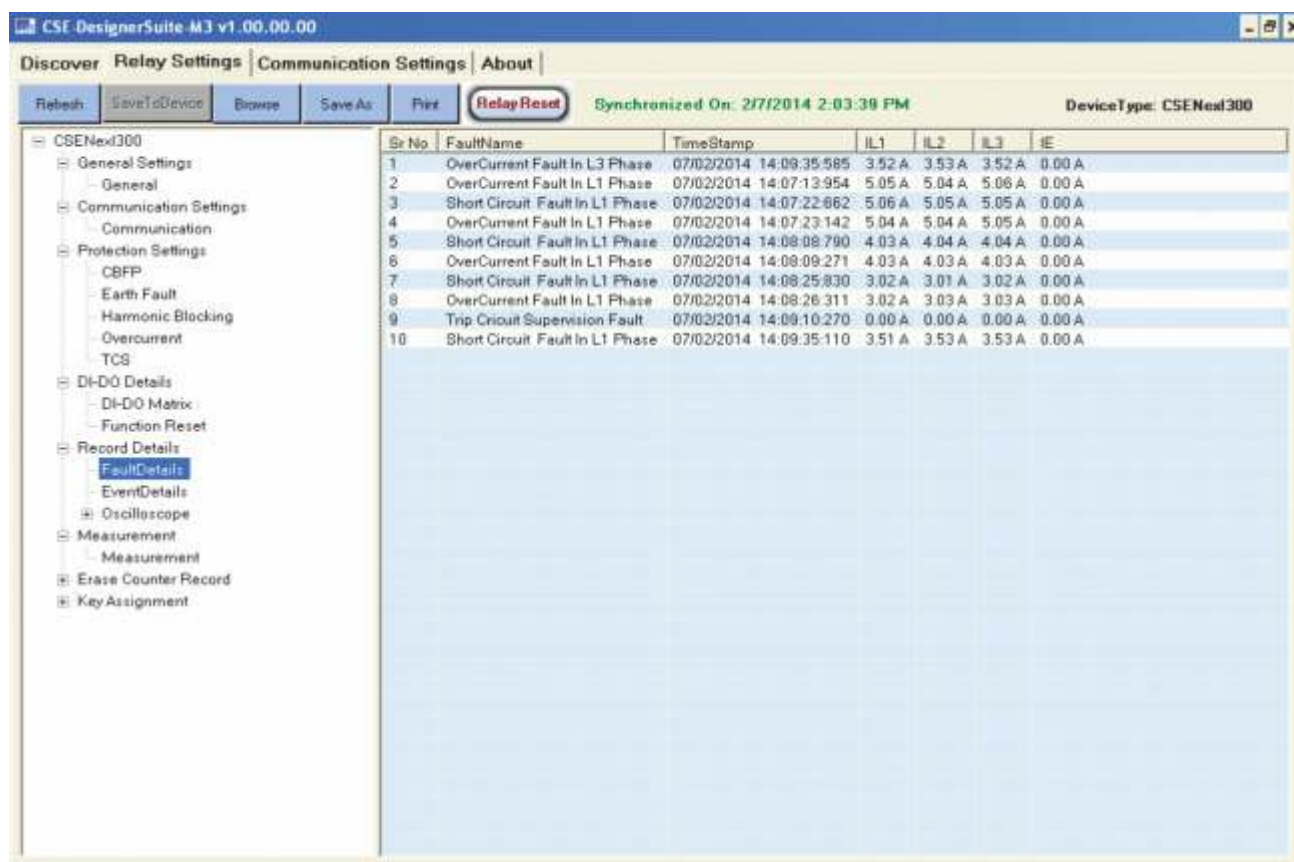
[F][ILx] Magnitude of phase current's.

[F]Ie Magnitude earth fault current's

F-Type Origin of fault (over current etc.)

whenever the available memory space is exhausted the new fault automatically over writes the oldest fault. When the relay trips the description of fault in the feeder will appears on the LCD screen automatically and by pressing 'i'key one can easily get all the detailed information of that fault.

The user can view the fault record either via the front USB interface software or remotely via the RS-485 communication.



Sr No	FaultName	TimeStamp	IL1	IL2	IL3	IE
1	OverCurrent Fault In L3 Phase	07/02/2014 14:09:35.585	3.52 A	3.53 A	3.52 A	0.00 A
2	OverCurrent Fault In L1 Phase	07/02/2014 14:07:13.954	5.05 A	5.04 A	5.06 A	0.00 A
3	Short Circuit Fault In L1 Phase	07/02/2014 14:07:22.662	5.06 A	5.05 A	5.05 A	0.00 A
4	OverCurrent Fault In L1 Phase	07/02/2014 14:07:23.142	5.04 A	5.04 A	5.05 A	0.00 A
5	Short Circuit Fault In L1 Phase	07/02/2014 14:08:08.790	4.03 A	4.04 A	4.04 A	0.00 A
6	OverCurrent Fault In L1 Phase	07/02/2014 14:08:09.271	4.03 A	4.03 A	4.03 A	0.00 A
7	Short Circuit Fault In L1 Phase	07/02/2014 14:08:25.830	3.02 A	3.01 A	3.02 A	0.00 A
8	OverCurrent Fault In L1 Phase	07/02/2014 14:08:26.311	3.02 A	3.03 A	3.03 A	0.00 A
9	Trip Circuit Supervision Fault	07/02/2014 14:09:10.270	0.00 A	0.00 A	0.00 A	0.00 A
10	Short Circuit Fault In L1 Phase	07/02/2014 14:09:35.110	3.51 A	3.53 A	3.53 A	0.00 A

(Figure 2) (Fault Data Recording on PC software)

8) Event Recording

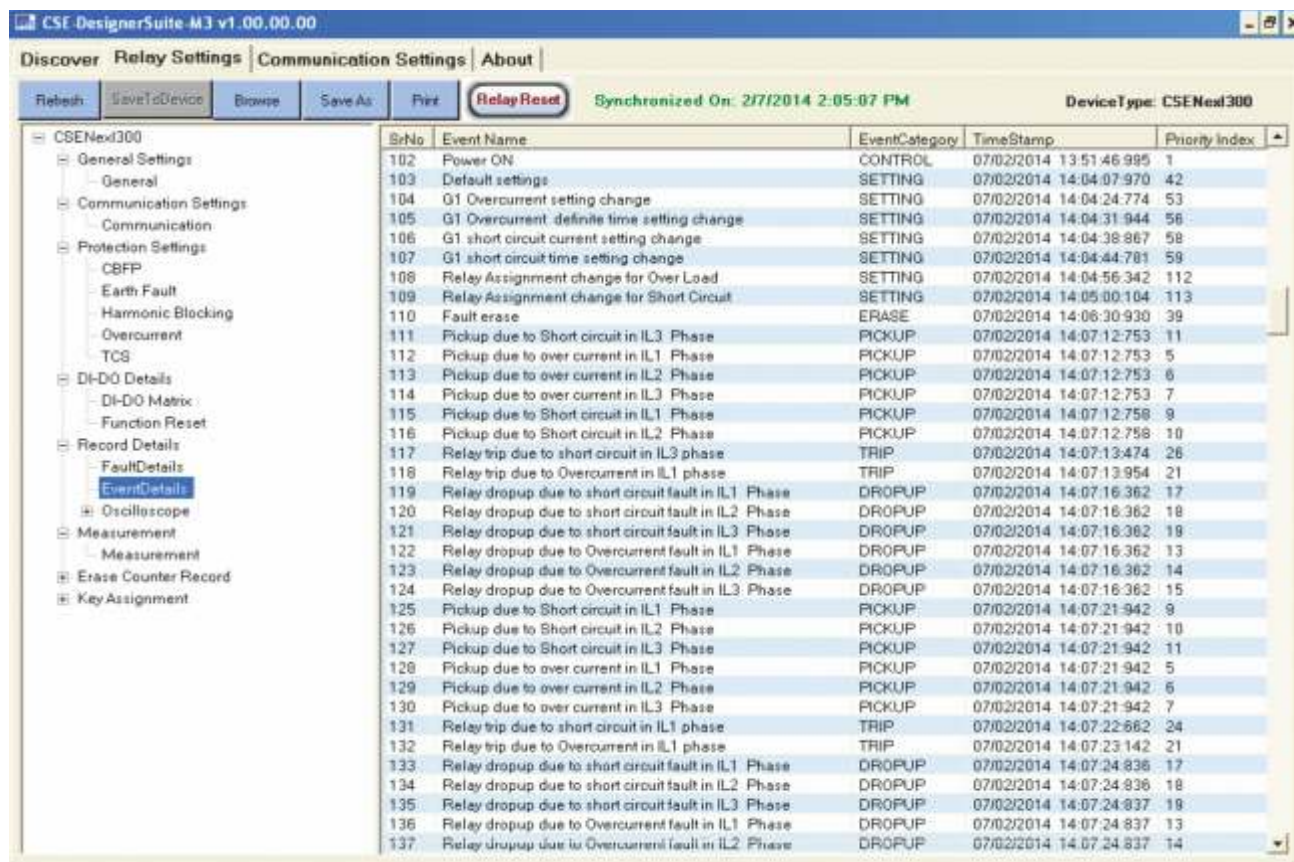
The unit stores in non volatile memory the last 500 events. When the available memory space is exhausted, the new event automatically overwrites the oldest event which can be retrieved from a PC, with the following format:

EVENT : EVENT NUMBER
 HOUR : HH:MM
 SEC mSEC : SEC:mSEC
 DATE : DD/MM/YY
 E-TYPE : TYPE OF EVENT

- ❖ Date and time of the event
- ❖ Descriptive text of the even

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

* Description of event number available in event list or in front end software



The screenshot shows the 'Event Details' window in the CSE DesignerSuite M3 v1.00.00.00 software. The window displays a table of events with columns: SrNo, Event Name, EventCategory, TimeStamp, and Priority Index. The table lists 37 events, including Power ON, Default settings, G1 Overcurrent setting change, G1 short circuit current setting change, G1 short circuit time setting change, Relay Assignment change for Over Load, Relay Assignment change for Short Circuit, Fault erase, Pickup due to Short circuit in IL3 Phase, Pickup due to over current in IL1 Phase, Pickup due to over current in IL2 Phase, Pickup due to over current in IL3 Phase, Pickup due to Short circuit in IL1 Phase, Pickup due to Short circuit in IL2 Phase, Pickup due to Short circuit in IL3 phase, Relay trip due to short circuit in IL1 phase, Relay trip due to Overcurrent in IL1 phase, Relay dropout due to short circuit fault in IL1 Phase, Relay dropout due to short circuit fault in IL2 Phase, Relay dropout due to short circuit fault in IL3 Phase, Relay dropout due to Overcurrent fault in IL1 Phase, Relay dropout due to Overcurrent fault in IL2 Phase, Relay dropout due to Overcurrent fault in IL3 Phase, Pickup due to Short circuit in IL1 Phase, Pickup due to Short circuit in IL2 Phase, Pickup due to Short circuit in IL3 Phase, Pickup due to over current in IL1 Phase, Pickup due to over current in IL2 Phase, Pickup due to over current in IL3 Phase, Relay trip due to short circuit in IL1 phase, Relay trip due to Overcurrent in IL1 phase, Relay dropout due to short circuit fault in IL1 Phase, Relay dropout due to short circuit fault in IL2 Phase, Relay dropout due to short circuit fault in IL3 Phase, Relay dropout due to Overcurrent fault in IL1 Phase, and Relay dropout due to Overcurrent fault in IL2 Phase.

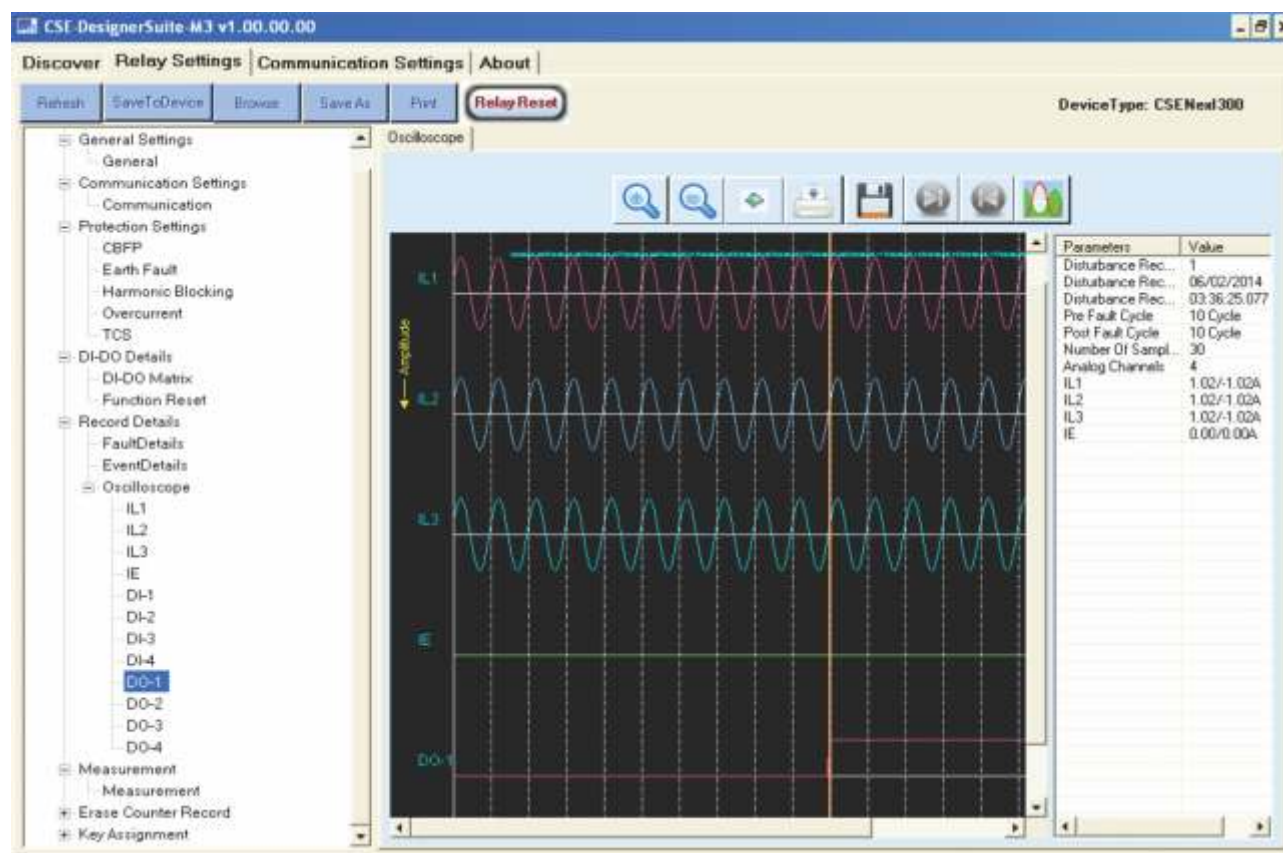
SrNo	Event Name	EventCategory	TimeStamp	Priority Index
102	Power ON	CONTROL	07/02/2014 13:51:46.995	1
103	Default settings	SETTING	07/02/2014 14:04:07.970	42
104	G1 Overcurrent setting change	SETTING	07/02/2014 14:04:24.774	53
105	G1 Overcurrent definite time setting change	SETTING	07/02/2014 14:04:31.944	56
106	G1 short circuit current setting change	SETTING	07/02/2014 14:04:38.867	58
107	G1 short circuit time setting change	SETTING	07/02/2014 14:04:44.781	59
108	Relay Assignment change for Over Load	SETTING	07/02/2014 14:04:56.342	112
109	Relay Assignment change for Short Circuit	SETTING	07/02/2014 14:05:00.104	113
110	Fault erase	ERASE	07/02/2014 14:06:30.930	39
111	Pickup due to Short circuit in IL3 Phase	PICKUP	07/02/2014 14:07:12.753	11
112	Pickup due to over current in IL1 Phase	PICKUP	07/02/2014 14:07:12.753	5
113	Pickup due to over current in IL2 Phase	PICKUP	07/02/2014 14:07:12.753	6
114	Pickup due to over current in IL3 Phase	PICKUP	07/02/2014 14:07:12.753	7
115	Pickup due to Short circuit in IL1 Phase	PICKUP	07/02/2014 14:07:12.758	9
116	Pickup due to Short circuit in IL2 Phase	PICKUP	07/02/2014 14:07:12.758	10
117	Relay trip due to short circuit in IL3 phase	TRIP	07/02/2014 14:07:13.474	26
118	Relay trip due to Overcurrent in IL1 phase	TRIP	07/02/2014 14:07:13.954	21
119	Relay dropout due to short circuit fault in IL1 Phase	DROPUP	07/02/2014 14:07:16.362	17
120	Relay dropout due to short circuit fault in IL2 Phase	DROPUP	07/02/2014 14:07:16.362	18
121	Relay dropout due to short circuit fault in IL3 Phase	DROPUP	07/02/2014 14:07:16.362	19
122	Relay dropout due to Overcurrent fault in IL1 Phase	DROPUP	07/02/2014 14:07:16.362	13
123	Relay dropout due to Overcurrent fault in IL2 Phase	DROPUP	07/02/2014 14:07:16.362	14
124	Relay dropout due to Overcurrent fault in IL3 Phase	DROPUP	07/02/2014 14:07:16.362	15
125	Pickup due to Short circuit in IL1 Phase	PICKUP	07/02/2014 14:07:21.942	9
126	Pickup due to Short circuit in IL2 Phase	PICKUP	07/02/2014 14:07:21.942	10
127	Pickup due to Short circuit in IL3 Phase	PICKUP	07/02/2014 14:07:21.942	11
128	Pickup due to over current in IL1 Phase	PICKUP	07/02/2014 14:07:21.942	5
129	Pickup due to over current in IL2 Phase	PICKUP	07/02/2014 14:07:21.942	6
130	Pickup due to over current in IL3 Phase	PICKUP	07/02/2014 14:07:21.942	7
131	Relay trip due to short circuit in IL1 phase	TRIP	07/02/2014 14:07:22.662	24
132	Relay trip due to Overcurrent in IL1 phase	TRIP	07/02/2014 14:07:23.142	21
133	Relay dropout due to short circuit fault in IL1 Phase	DROPUP	07/02/2014 14:07:24.836	17
134	Relay dropout due to short circuit fault in IL2 Phase	DROPUP	07/02/2014 14:07:24.836	18
135	Relay dropout due to short circuit fault in IL3 Phase	DROPUP	07/02/2014 14:07:24.837	19
136	Relay dropout due to Overcurrent fault in IL1 Phase	DROPUP	07/02/2014 14:07:24.837	13
137	Relay dropout due to Overcurrent fault in IL2 Phase	DROPUP	07/02/2014 14:07:24.837	14

(Figure 3) (Event Data Recording on PC software)

9) Disturbance Record

The 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 4 analog signals and the status of 4 digital inputs and 6 digital outputs. There will be 30 samples per cycle.
- ❖ Relay saves maximum 1200 cycles, and the number of cycles per record is programmable (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 of oscilloscope (disturbance) record setting).
- ❖ Records are in the non volatile memory.
- ❖ The records are transferred to PC using USB interface. The data is graphically displayed & can be taken on printer.
- ❖ Record 1 is always latest record. 2nd record is older than 1st..... and so on.
- ❖ Disturbance record in comtrade format as per IEC60255-24.



(Figure 4) (Disturbance Recording on PC software)

Output Contacts

No. of Relays	:	4 (DO1, DO2, DO3, DO4)
No. of Digital output contacts	:	6 (Combination of NO/NC/COM See Connection diagram on Page no. 18)
Programmable (DO Assignment)	:	Yes (See Table on Page no. 13)
Relay reset type	:	Programmable (Auto/Manual)
Trip Test	:	Relay is having Trip Test facility to check the operation of each Do's individually via front HMI / key pad in TRIP TEST menu.

Input Contacts

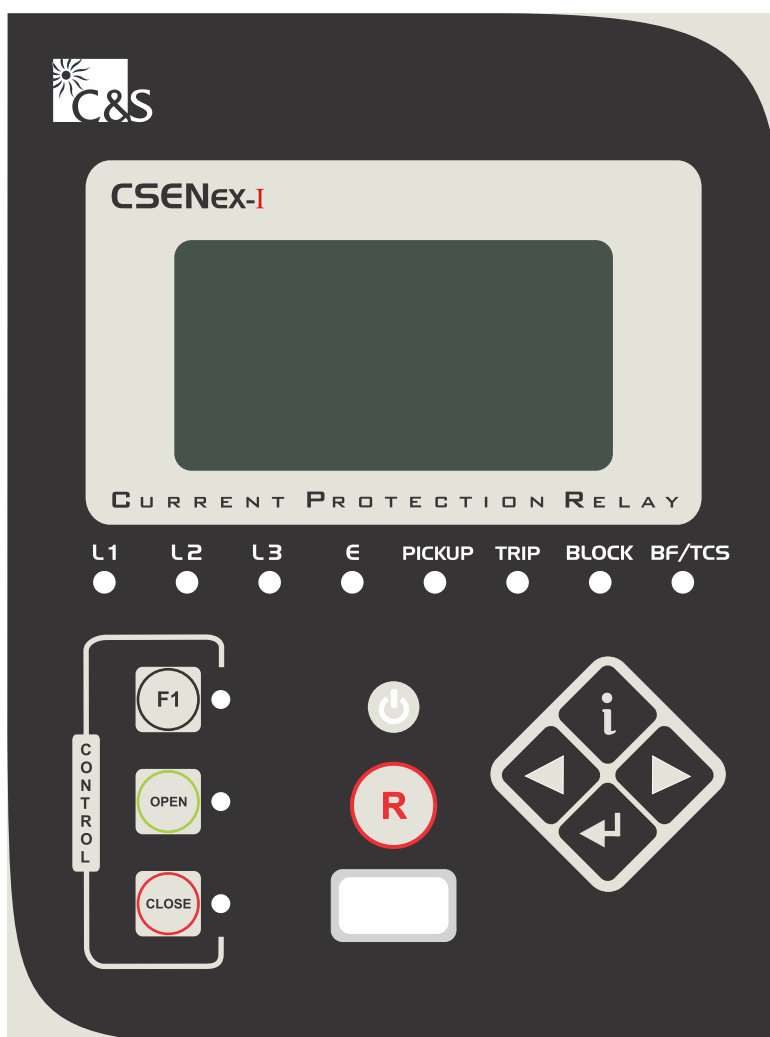
No of digital inputs	:	4 (DI1, DI2, DI3, DI4)
Programmable (DI Assignment)	:	Programmable

10) 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.
- ❖ One push switch for the functions assigned in the 'HMI' to 'F1' key, 2 push switch to open or close circuit breaker.
- ❖ Eight RED color LEDs for pickup or tripping on fault and event in any phase.

Keys	Manual Key
	is used as intelligent key to see the details of last fault and Relay status.
	is used as a "ENTER" key.
	is used to manual reset (after pressing for 2 sec).
	is used to scroll in backward direction.
	is used to scroll in forward direction.
	To perform the assigned task either DO trip or Relay reset.
	To open the circuit breaker.
	To close the circuit breaker.



(Figure 5) (HMI)

11) Communication (Local and Remote)

The unit has:

- ❖ 1 Front USB port for direct connection to a PC
- ❖ 1 Rear RS-485 communication port

11.1) Rear Communication

The protocol for the rear port is MODBUS-RTU / IEC 60870-103.

11.2) Front Communication

The entire setting, Fault & Event 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.

12) Setting Ranges

CSENEX-I3xx Relay is having two group of protection settings, any one can be activated by selection in active group.

All editable settings are password protected.

Active Group Setting

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

Over Current and Earth Protection

S. No	Parameter	Display	Setting Range		Step Size	Default Setting
			Min.	Max.		
1	Phase characteristics	P-Char			DEFT/EINV/VINV /LINV/NINV1.3/ NINV3.0/NINV0.6	DEFT
2	Earth Characteristics	E-Char			DEFT/EINV/VINV /LINV/NINV1.3/ NINV3.0/NINV0.6	DEFT
3	Phase over-current low set pickup setting Phase over-current definite timing Phase over-current inverse timing	I> t> ti>	0.20xIp 0.1 Sec 0.01	4.0xIp 150 Sec 1.50	0.01xIp 0.01Sec 0.005	Disable 0.10 Sec 0.01
4	Phase over-current hi-set pickup setting Phase over-current hi-set definite timing	I>> t>>	0.5xIp 0.02 Sec	30xIp 20 Sec	0.5xIp 0.01Sec	Disable 0.02 Sec
5	Earth over-current low set pickup setting Earth over-current low set definite timing Earth over-current low set inverse timing	Ie> te> tie>	0.05xIn 0.03 Sec 0.01	2.5xIn 150 Sec 1.50	0.01xIn 0.01Sec 0.005	Disable 0.03 Sec 0.01
6	Earth over-current hi-set pickup setting Earth over-current hi-set definite timing	Ie>> te>>	0.5xIn 0.02 Sec	15xIn 20 Sec	0.05xIn 0.01 Sec	Disable 0.02 Sec

Very Inverse $t = \frac{13.5}{(I/I_s) - 1} \quad t_i [s]$

Extremely Inverse $t = \frac{80}{(I/I_s)^2 - 1} \quad t_i [s]$

Long time Inverse $t = \frac{120}{(I/I_s) - 1} \quad t_i [s]$

Normal Inverse 3.0/1.3 /0.6 $t = \frac{0.14/0.061/0.028}{(I/I_s) 0.02 - 1} \quad t_i [s]$

Where t = Tripping time t_i = Time multiplier
 I = Fault current I_s = Setting value of current

Trip timing Accuracy : DEFT/ NINV 0.6 / NINV 3.0 / 1.3 : $\pm 5\%$ OR $\pm 30\text{mSec}$ (whichever is higher)
 EINV / VINV / LINV : $\pm 7.5\%$ OR $\pm 30\text{mSec}$ (whichever is higher)

Trip Circuit Supervision Protection

S.No.	Parameter	Display	Setting Range		Step Size	Default Setting
			Min.	Max.		
1	TCS	t_TCS	0.03 Sec	2 Sec	0.01	Disable

Circuit Breaker Failure Protection

S.No.	Parameter	Display	Setting Range		Step Size	Default Setting
			Min.	Max.		
1	CBFP	t_CBFP	0.03 Sec	2 Sec	0.01	Disable

Harmonic Setting

Parameters	Display	Setting Range		Step Size	Default Setting
		Min	Max		
Phase 2nd harmonic block	P2ndH	10%If	50%If	2	Disable
Phase 3rd harmonic block	P3rdH	10%If	50%If	2	Disable
Earth 2nd harmonic block	E2ndH	10%If	50%If	2	Disable
Earth 3rd harmonic block	E3rdH	10%If	50%If	2	Disable
Phase blocking time	tPHASE	0 Sec	20 Sec	0.1 Sec	0 Sec
Earth block time	tEARTH	0 Sec	20 Sec	0.1 Sec	0 Sec

Cold Load Pickup Setting

S.No	Parameter	Display	Min	Max
1	Cold Load Pickup enable	CLP PKUP	Enable	Disable
2	Cold Load Time	tcold	0.00 s	100.00 s
3	Cold Load Pickup Time	tcip	0.00 s	100.00 s

DI Assignment

Parameters	Display
Circuit breaker close	CB Close
Circuit breaker open	CB Open
Remote trip	Rmt Trp
Group toggle	GRP togg
Remote reset	RMT RSET
Oscillator trigger	OSC Trig
Over current block	I>BLK
Short circuit block	I>>BLK
Earth block	Ie>BLK
Earth high block	Ie>>BLK

DO Assignment

S.No	Parameter	Display	Setting Range		Step Size	Default Setting
			Min.	Max.		
1	Phase over-current low set	I>	---	---	DO1/DO2/DO3/DO4	---
2	Phase over-current hi-set	I>>	---	---	DO1/DO2/DO3/DO4	---
3	Earth over-current low set	Ie>	---	---	DO1/DO2/DO3/DO4	---
4	Earth over-current hi-set	Ie>>	---	---	DO1/DO2/DO3/DO4	---
5	Self supervision	SELF SUP	---	---	DO1/DO2/DO3/DO4	---
6	Circuit breaker failure protection	CBFP	---	---	DO1/DO2/DO3/DO4	---
7	Trip circuit supervision	TCS	---	---	DO1/DO2/DO3/DO4	---
8	Circuit breaker open	CB_Open	---	---	DO1/DO2/DO3/DO4	---
9	Circuit breaker close	CB_Close	---	---	DO1/DO2/DO3/DO4	---
10	Remote Trip	Rmt Trip	---	---	DO1/DO2/DO3/DO4	---

Function Reset

S.No.	Parameter	Display	Setting Range		Step Size	Default Setting
			Min.	Max.		
1	Phase over-current low set	I>	Auto	Manual	-----	Auto
2	Phase over-current hi set	I>>	Auto	Manual	-----	Auto
3	Earth over-current low set	Ie>	Auto	Manual	-----	Auto
4	Earth over-current hi set	Ie>>	Auto	Manual	-----	Auto
5	Trip Circuit Supervision	TCS	Auto	Manual	-----	Auto
6	Remote Trip	RmtTrip	Auto	Manual	-----	Auto

Oscilloscope (Disturbance) Record Setting

Parameters	Display	Setting Range	
		Min	Max
Oscilloscope recording selection	RECORD	No	Yes
Pre-fault cycle	PRE CYCLE	2	298
Post-fault cycle	POST CYCLE	2	298
Triggering mode	TRIG. MODE	Pickup	Trip, DI, anyone

General Setting: (These are the settings common for all protections)

S.No.	Parameter	Display	Setting Range		Step Size	Default Setting
			Min.	Max.		
1	Rated phase current	Ip	1.00 Amp	5.00 Amp	-----	1.00 Amp
2	Rated earth current	In	1.00 Amp	5.00 Amp	-----	1.00 Amp
3	Phase CT ratio	Ph CT Rtio	1	9999	1	1
4	Earth CT ratio	E CT Rtio	1	9999	1	1
5	Nominal frequency	FREQ(Fn)	50 Hz	60 Hz	-----	50 Hz
6	Fault Message status	[F] Stat	Enable	Disable	-----	Enable

Rear port communication setting

(*Availability as per Model Selection)

RS-485 Communication		
Protocol	:	MODBUS RTU/ IEC 60870-103
Baud rate selection (programmable)	:	4800/9600/19200/38400/57600 bps (MODBUS RTU)
	:	9600/19200/38400 bps (IEC 60870-103)
Parity selection (programmable)	:	Even / Odd / None
Stop bit	:	1 Bit
Data bit	:	8 Bit data
Remote Address (programmable)	:	(1 to 247)
Cable required for interface	:	Two wire twisted shielded cable

USB Communication		
Protocol	:	CSE proprietary protocol: available with front software
Cable required for interface	:	USB cable type (A to A)

Auxiliary Supply

Auxiliary Voltage Range	For 'L' Model	18V-60V DC
	For 'H' Model	85V-280V AC / 90V-300V DC
Supply Range for Digital Input	For 'L & H' Model	Above 40V AC/DC
Power Consumption		Quiescent approx. 3W Operating approx. <7W

Measurement Accuracy

S.No	Quantity	Range	Frequency Range	Accuracy
1	Phase Current	1 - 30 xI _p	50 - 60 Hz	±2%
2	Earth Current	1 - 15 xI _n	50 - 60 Hz	±2%

Pickup Accuracy

S.No	Quantity	Range	Frequency Range	Accuracy
1	Current	1 - 30 xI _p , 1-15xI _n	50 - 60 Hz	±5% of Pickup setting

13) Technical Data

Measuring Inputs

Rated Data	Rated current I _p : 1A or 5A Rated frequency F _n : 50 Hz/60Hz
Drop out to Pickup Ratio	>96%
Power consumption in current circuit	At I _p =1A 0.2 VA At I _p =5A 0.4 VA
Thermal withstand capability in current circuit	Dynamic current withstand (half wave): 250 x I _p for 1 Sec : 100 x I _p for 10 Sec : 30 x I _p continuously : 4 x I _p

Relay 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
Breaking Characteristics	
Breaking capacity AC	1500VA resistive 1500VA inductive (PF=0.5)
Breaking capacity DC	220V AC, 5A (cosØ ≤0.6) 135V DC, 0.3A (L/R=30ms) 250V DC, 50W resistive or 25W inductive (L/R=40ms)
Operation time	<10ms
Durability	
Loaded contact	30000 operation minimum
Unloaded contact	10000 operation minimum

Over-voltage category : II
Insulation voltage : 300V
Pollution Degree : 2
IP 54 from Front

14) Type Test

DESIGN STANDARD	
Specified ambient service temp. range	: VDE 04355 part 303, IEC 255-4, BS 142
For storage	: 40 deg C to + 85 deg C
For operation	: -20 deg C to 70 deg C
Environmental protection class 'F' as per DIN 40040 and per DIN IEC 68, part 2.3	: relative humidity 95% at 40 deg C for 56 days.
Isolation test voltage, inputs and outputs between themselves and to the relay frame as per VDE 0435, part 303	: 2.5 KV (eff.) / 50 Hz, 1 min.
Impulse test voltage, inputs and outputs between themselves and to the relay frame as per VDE IEC 0435, part 303	: 5 KV, 1.2/50 μs, 0.5J
High frequency interference test voltage, inputs and outputs between themselves and to the relay frame as per DIN IEC 255, part 22-1	: 2.5 KV/1MHz
Electrical fast transient (burst) test as per DIN VDE 0843 part 4	: 4KV / 2.5 kHz, 15ms
Radio interference suppression test as per DIN VDE 57 871	: Limit value class 'B'
Electrostatic discharge (ESD) test as per DIN VDE 0843 part 2	: 8 KV
Radiated electromagnetic field test as per VDE 0843 part2	: 10 V/m

15) Technical Test

Shock	:	As per DIN IEC 41 B (CO) 38: class 1
Vibration	:	As per DIN IEC 41 B (CO) 35: class 1
Protection-Front Panel	:	IP 54
Protection-Rear Panel	:	IP 00
Weight	:	Approx. 1.0 Kg

16) Other variants of CSENEX-I family

Model Selection Table

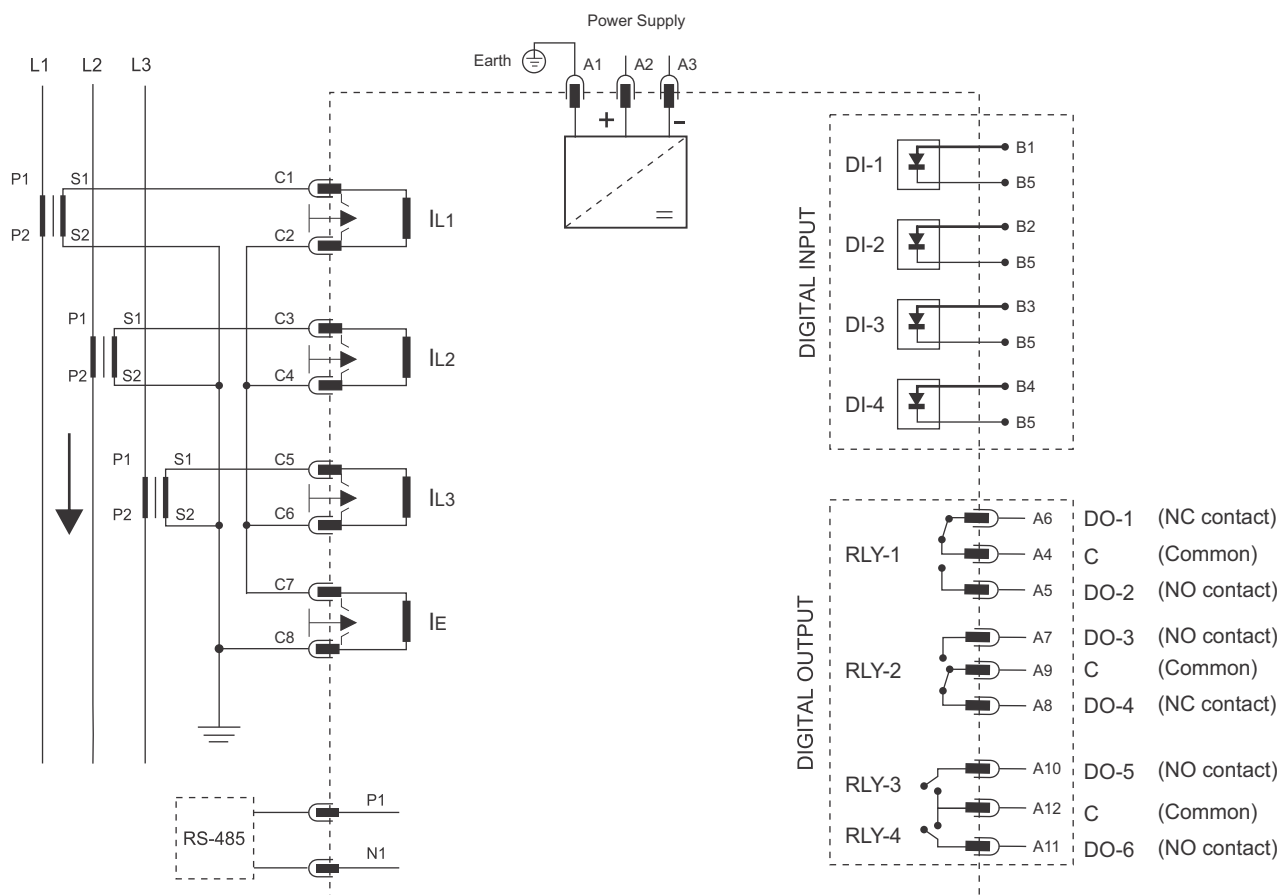
Function	ANSI	NEX-I 300	Nex-I 2xx	Nex-I 100
CT inputs	–	4	4	4
Over current	50/51	✓	✓	✓
Earth Fault	50N/51N	✓	✓	✓
CBFP	50BF	✓	✓	✓
Trip circuit	74TC	✓	✓	✓
Inrush blocking	51H	✓	✓	✓
Digital input	–	4	6	2
Digital output	–	6	6	6
Fault record	–	10	10	10
Event record	–	500	50	16
Oscilloscope Record	–	✓	x	x
Selection of 1/5A	–	Site selectable	Site selectable	Site selectable
Enclosure type	–	Draw out	Draw out	Draw out
Enclosure size (WxHxD)	–	(112x145x145)	(112x145x145)	(112x145x145)
Front communication	–	✓	✓	✓
Rear comm. (RS-485)	–	✓	✓	✓

Enclose size dimensions are in mm.

17) Connection Diagram

Terminal Connection Details

CSENEX-I 300

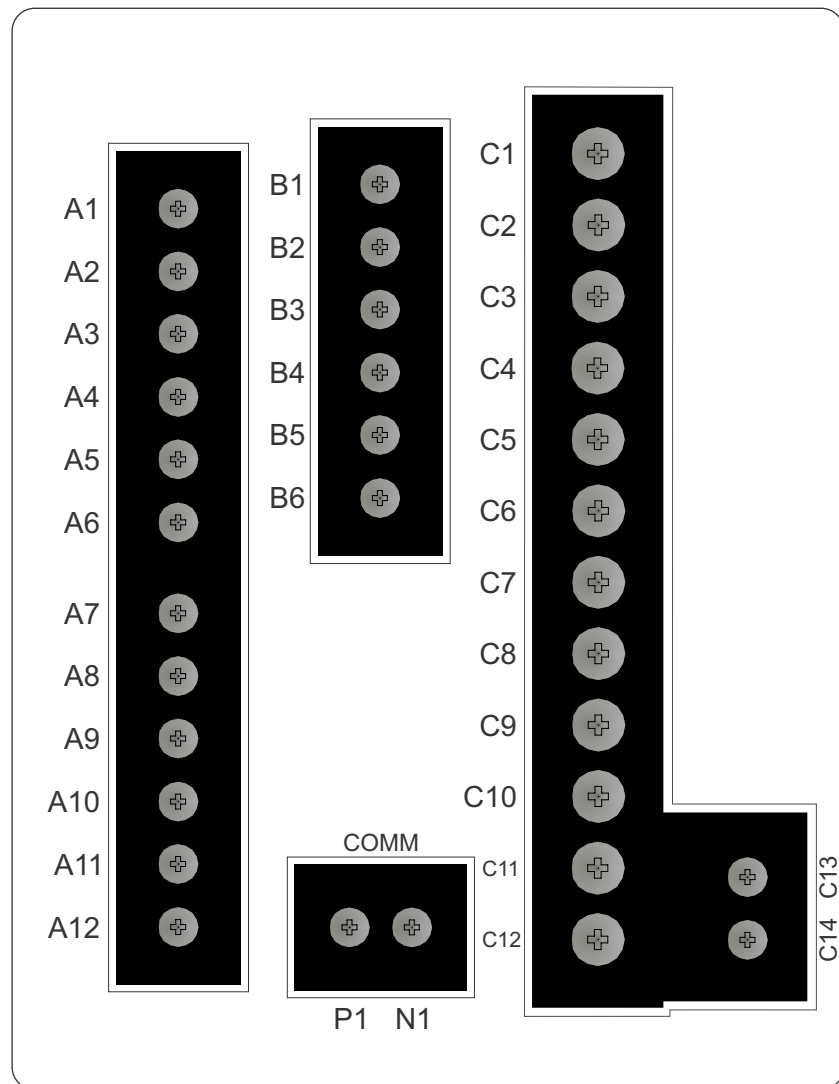


(Figure 6)

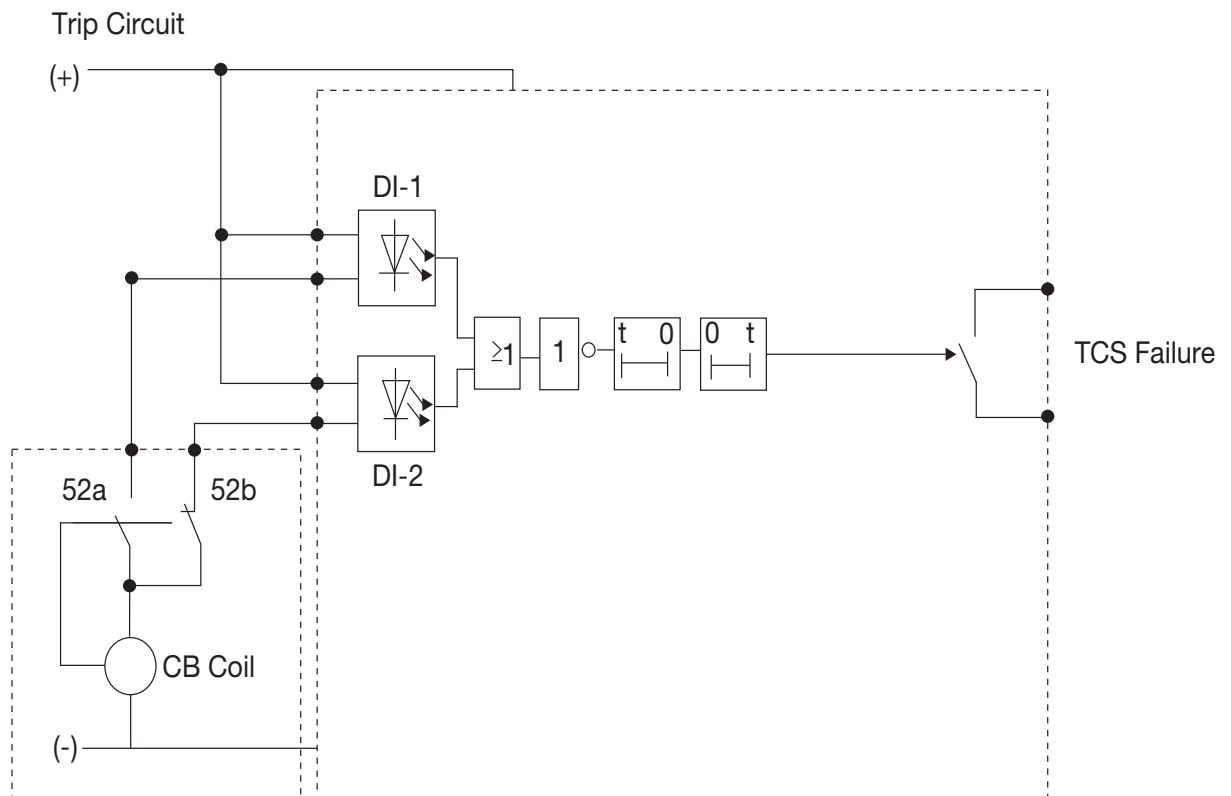
Terminal Description

Terminal Name	Terminal Description
A1	: Auxiliary Supply Earth
A2-A3	: Auxiliary Supply
P1-N1	: RS-485 Modbus P1, N1
A5-A4-A6	: Potential free Relay-1 Output
A7-A9-A8	: Potential free Relay-2 Output
A10-A12	: Potential free Relay-3 Output
A11-A12	: Potential free Relay-4 Output
DI-1	: B1-B5
DI-2	: B2-B5
DI-3	: B3-B5
DI-4	: B4-B5
DO-1 Contact	: A4-A6
DO-2 Contact	: A4-A5
DO-3 Contact	: A7-A9
DO-4 Contact	: A9-A8
DO-5 Contact	: A10-A12
DO-6 Contact	: A12-A11
C1-C6	: CT Terminal for Phase current Input L1(C1-C2), L2(C3-C4), L3(C5-C6)
C7-C8	: CT Terminal for Earth current input

18) Back Terminal Diagram



19) Trip Circuit Supervision

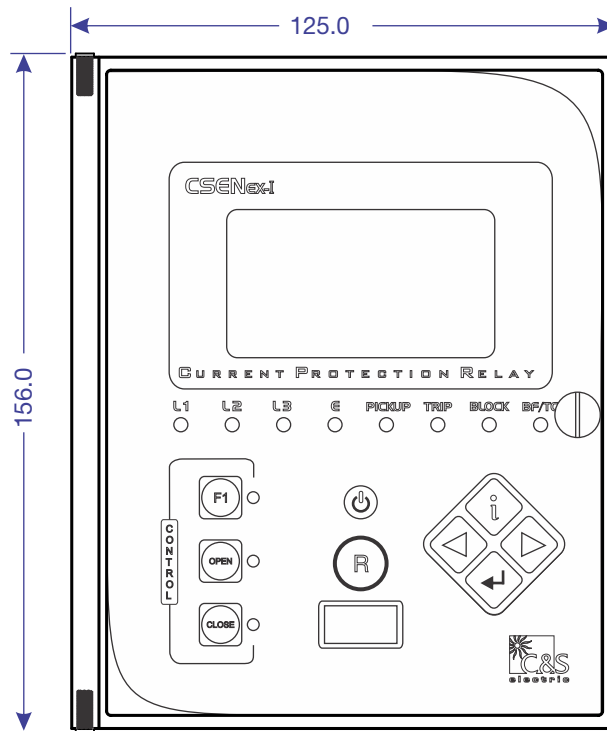


(Figure 7)

(Note: CB coil resistance should be such that at least 4mA current must flow in each Digital Input)

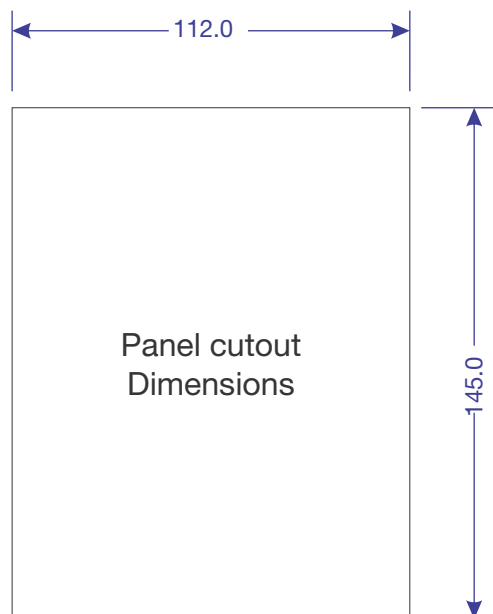
20) Dimensional Details

Front View



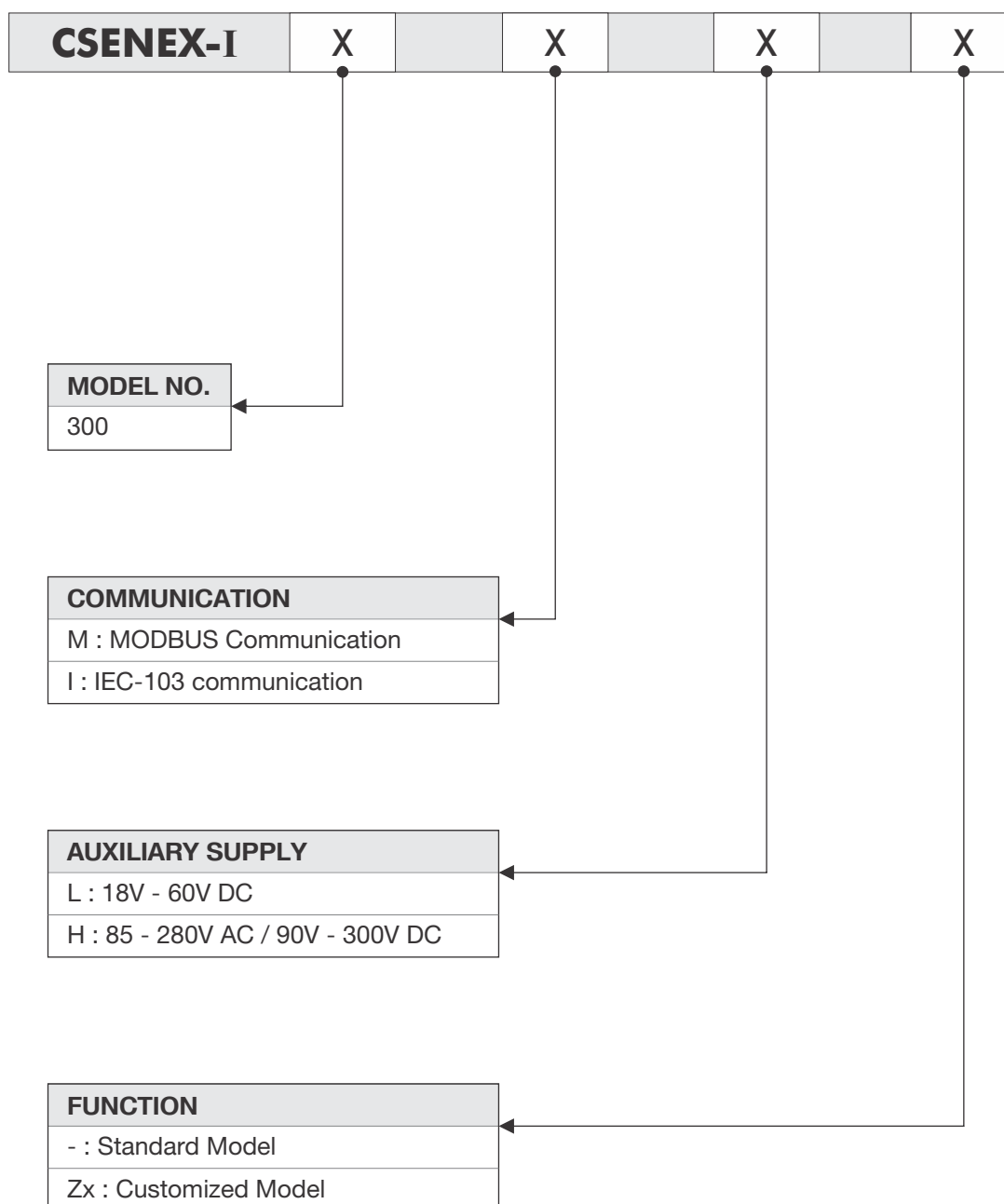
(Figure 8)

Panel cutout dimensions: WxH = 112.0x145.0mm



(Figure 9)

21) Ordering Information



Revision History

[illegible]

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