

We touch your **electricity** everyday!

CSENEX-I 300-C1

Intelligent Measuring and Protection Device

CSENEX
Series



Catalogue

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1) Introduction

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

CSENX-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 CSENX series, the CSENX-I is an advanced feeder protection solution which has fast, sensitive and secure protection for feeder internal & external faults.

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

2) Features

- ❖ 1A & 5A rated CT input (programmable)
- ❖ Draw out with self CT shorting
- ❖ DI/DO programmable matrix
- ❖ Protection blocking through DI
- ❖ Three phase time over-current protection
- ❖ Three phase instantaneous protection
- ❖ Earth time over-current and earth instantaneous over current
- ❖ Circuit breaker failure detection
- ❖ Trip circuit supervision
- ❖ Auto Recloser
- ❖ Cold Load Pickup
- ❖ Harmonic Blocking
- ❖ Event record
- ❖ Fault record
- ❖ Disturbance record
- ❖ Communication (Local & Remote)

3) Application

The CSENX-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.

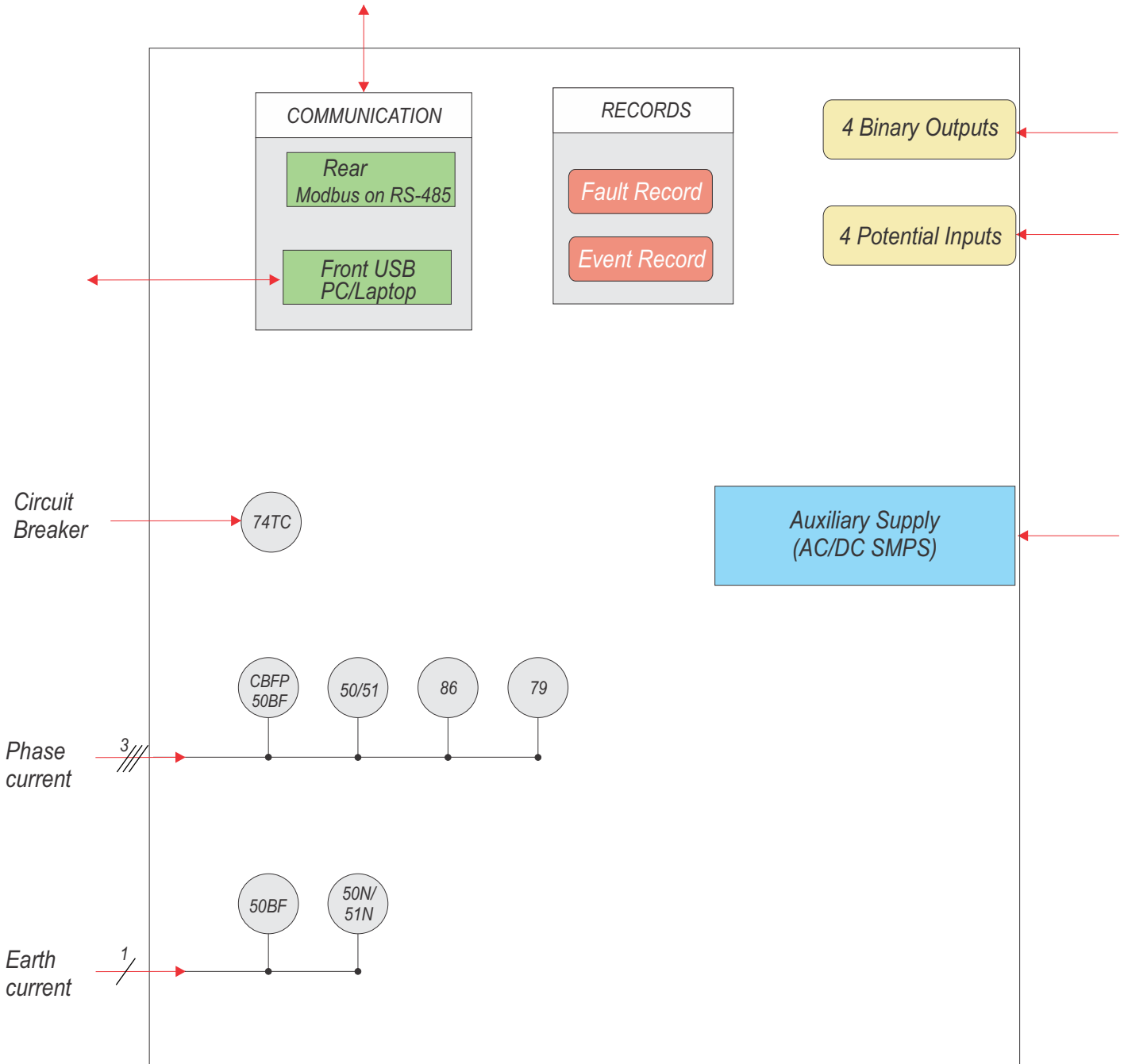
4) Hardware

- ❖ Digital Signal Processor based numeric design.
- ❖ Measures true RMS with DFT filter .
- ❖ 4 Current analog inputs for phase & earth fault current.
- ❖ 4 Digital Inputs.
- ❖ 4 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)
- ❖ Auto-recloser (79)
- ❖ Harmonic Blocking

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 stage can be configured with definite time only.

Very Inverse	$t = \frac{13.5}{(I/I_S) - 1} t_i [s]$
Extremely Inverse	$t = \frac{80}{(I/I_S)^2 - 1} t_i [s]$
Long time Inverse	$t = \frac{120}{(I/I_S) - 1} t_i [s]$
Normal Inverse 3.0/1.3/0.6	$t = \frac{0.14/0.061/0.028}{(I/I_S)^{0.02} - 1} t_i [s]$

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)

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 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 Blocking

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 CB 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 I_n within t_{CBFP} . If one or more of the phase currents have not dropped to specified current within this time, CB 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 exceeded again 0.15A, the protection usual setting (Group1 or Group2 or Group3) values are replaced by the cold load pickup ones (Group4). When any of the phase current exceed 0.15A a counter with programmable time starts, during which the settings are the cold load pickup ones (Group4). When expiring this time, the settings are again the usual ones (Group1,2,3). For settings Refer Cold Load Pickup Table in Setting Ranges.

Auto Re-closer Strategy (79)

As 80% of faults in overhead lines are transient, the use of the auto re-closer is very advantageous. Automatic auto-recloser allows a substation to operate unattended. The number of visits on site to manually re-close a circuit breaker after a fault, can then be substantially reduced. This feature gives an important advantage for substations supervised remotely.

Typically this auto re-close (AR) sequence of Instantaneous Trip(s) and Re-close Delays (Dead times) followed by Delayed Trip(s) provide the automatic optimum method of clearing all types of faults i.e. both Transient and Permanent, as quickly as possible and helps in improving the up time of the network in service.

DI Inputs:

AR Blocking - To block the auto re-closer through remote DI

CB Close DI - To get the circuit breaker status

CB Ready - To get the CB ready or to give the closing command

Configurable Outputs:

79 AR Close CB

79 Lockout

AR - Blocked:

Unit changes immediately to "AR-blocked" status when an external AR Blocking DI is applied or internal EXIT is chosen for AR cycle in MMI. No Auto re-closing is possible in "AR-blocked" status.

Activating of AR:

Prior to every AR it is possible to select which kind of tripping (I> or I>>, Ie> etc.) will lead to automatic re-closing. This can be separately fixed for each protection.

Dead time (td):

Starts with the off signal of the circuit breaker. No closing command to the circuit breaker is given till expiry of the set dead time.

User programmable dead times are available for each protection trip operation.

The dead time is initiated when the trip output contact resets, the pickup is reset and the CB is open.

The CB close output relay is energized after the dead time has elapsed If CB ready input is present.

The dead time (dead time td1, dead time td2 dead time td3 dead time td4) starts when the feedback on 'CB CLOSE DI' is not available.

Reclaim time (tr):

This is the time during which after switching on or after AR a subsequent re-closing is prevented.

If the number of the set shots is reached, the relay is locked for this time after the last re-closing attempt.

If CB Ready DI is not available relay will not generate closing command.

If the circuit breaker dose not trip again, the auto re-close cycle resets to original STATE-1 at the end of the reclaim time.

successful re-closure the relays goes to the lock out state

If the protection operates during the reclaim time of the relay:

* either advances to the next AR cycle that is expected in next auto re-close state or

* if all the programmed re-closer attempts have been accomplished, it locks out.

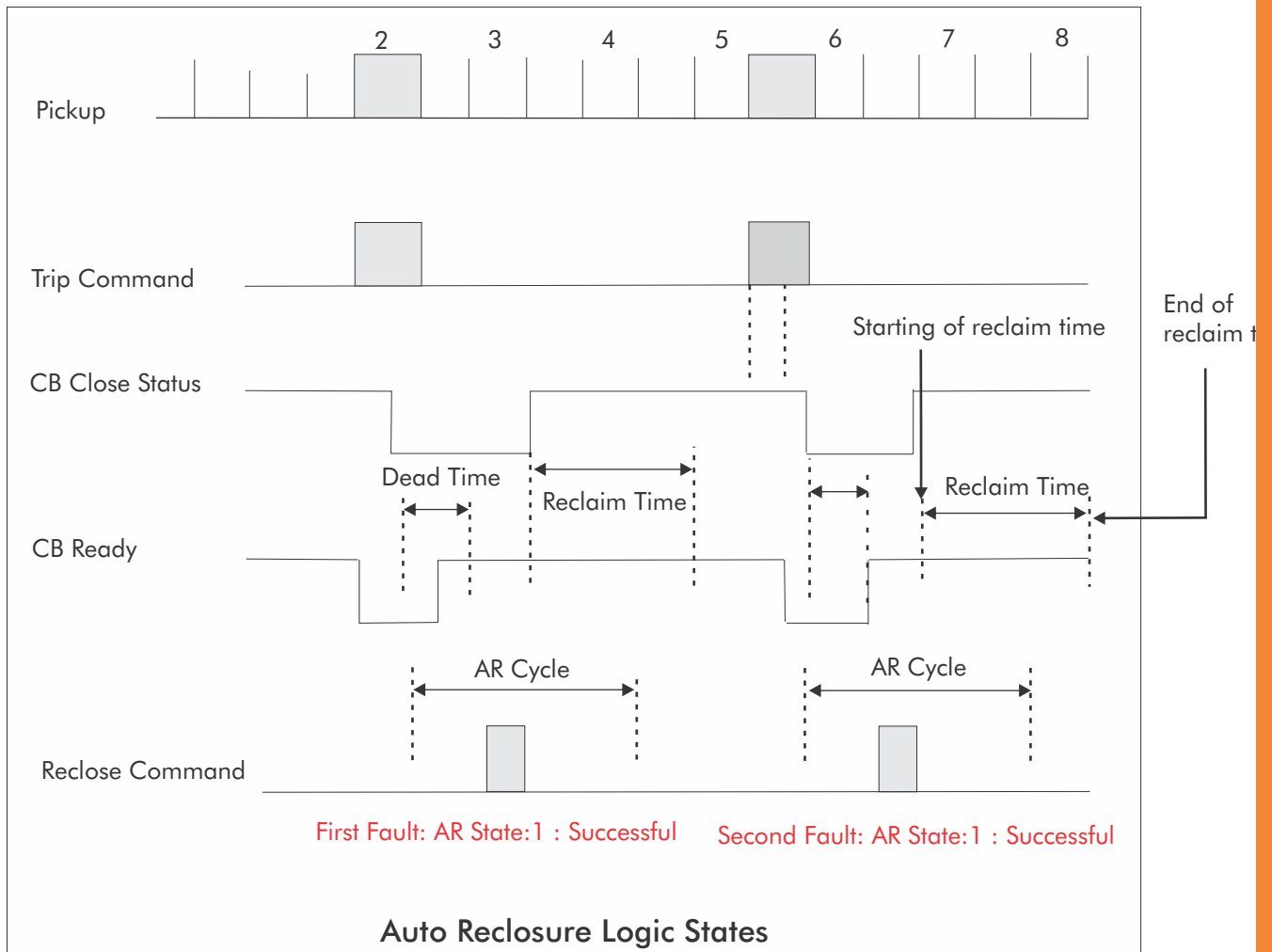
Once a CB has re-closed and remained closed for a specified time period (the reclaim time), the AR sequence is reinitialized and a successful close output issued. A single common reclaim time is used (Reclaim Timer). when an auto re-close sequence does not result in a Starting Condition for Auto re-closer

- 1) AR should be enabled by manual setting.
- 2) AR blocked DI is not available
- 3) Respective protection AR cycle should not in exit condition.

Lock out State:

Lockout state of the breaker means no further attempts to AR in these conditions

- 1) Lockout occurs when all auto re-closure attempts are over and protection operates during the final Reclaim Time.
 - 2) If CBFP failure appeared in relay (if CBFP enable).
 - 3) At the end of the each reclaim timer if the CB is in the open position (Close DI is not present).
 - 4) If a Close pulse of AR relay is given and the CB fails to close through close DI input or expiry of Trip Contact Sense time.
 - 5) If a open pulse given to CB and CB fails to open in between Trip Contact Sense time.
- In any of these cases, Manual reset will be required to reinitiate the AR. Refer table-17 for this protections settings.



7) Fault Record

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

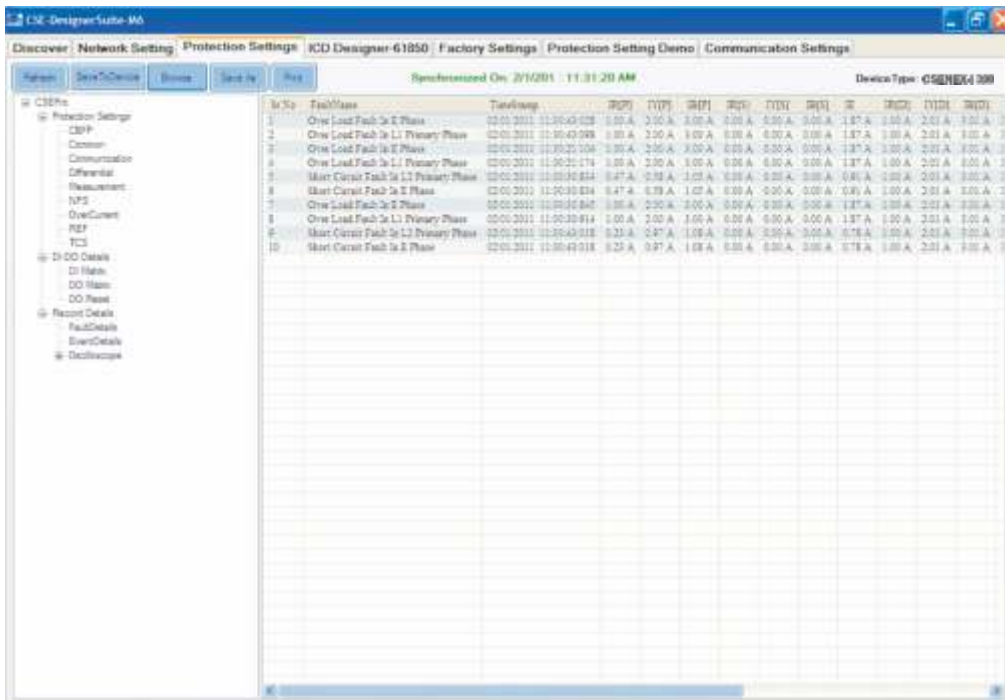
[F]IL1 : 00.00A
 [F]IL2 : 00.00A
 [F]IL3 : 00.00A
 [F]Ie : 00.00A
 HOUR MIN : HH:MM
 SEC mSEC : Sec:mSec
 F-TYPE : FAULT TYPE

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.(See figure-2)



Sr No	Fault Name	Time/Date	I1	I2	I3	Ie	I1A	I1B	I1C	I2A	I2B	I2C	I3A	I3B	I3C
1	Over Load Fault In R Phase	02.01.2011 11:30:43 028	1.00 A	1.00 A	1.00 A	0.00 A	1.87 A	1.00 A	2.01 A	1.00 A					
2	Over Load Fault In L1 Primary Phase	02.01.2011 11:30:43 048	1.00 A	1.00 A	1.00 A	0.00 A	1.87 A	1.00 A	2.01 A	1.00 A					
3	Over Load Fault In R Phase	02.01.2011 11:30:21 108	1.00 A	1.00 A	1.00 A	0.00 A	1.87 A	1.00 A	2.01 A	1.00 A					
4	Over Load Fault In L1 Primary Phase	02.01.2011 11:30:21 178	1.00 A	1.00 A	1.00 A	0.00 A	1.87 A	1.00 A	2.01 A	1.00 A					
5	Short Circuit Fault In L1 Primary Phase	02.01.2011 11:30:16 814	0.47 A	0.13 A	0.03 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A
6	Over Load Fault In R Phase	02.01.2011 11:30:10 834	0.47 A	0.13 A	0.03 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A
7	Over Load Fault In R Phase	02.01.2011 11:30:10 847	1.00 A	1.00 A	1.00 A	0.00 A	1.87 A	1.00 A	2.01 A	1.00 A					
8	Over Load Fault In L1 Primary Phase	02.01.2011 11:30:10 814	1.00 A	1.00 A	1.00 A	0.00 A	1.87 A	1.00 A	2.01 A	1.00 A					
9	Short Circuit Fault In L1 Primary Phase	02.01.2011 11:30:43 018	0.21 A	0.47 A	1.08 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A
10	Short Circuit Fault In R Phase	02.01.2011 11:30:43 018	0.25 A	0.97 A	1.08 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A	0.00 A

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

8) Event Record

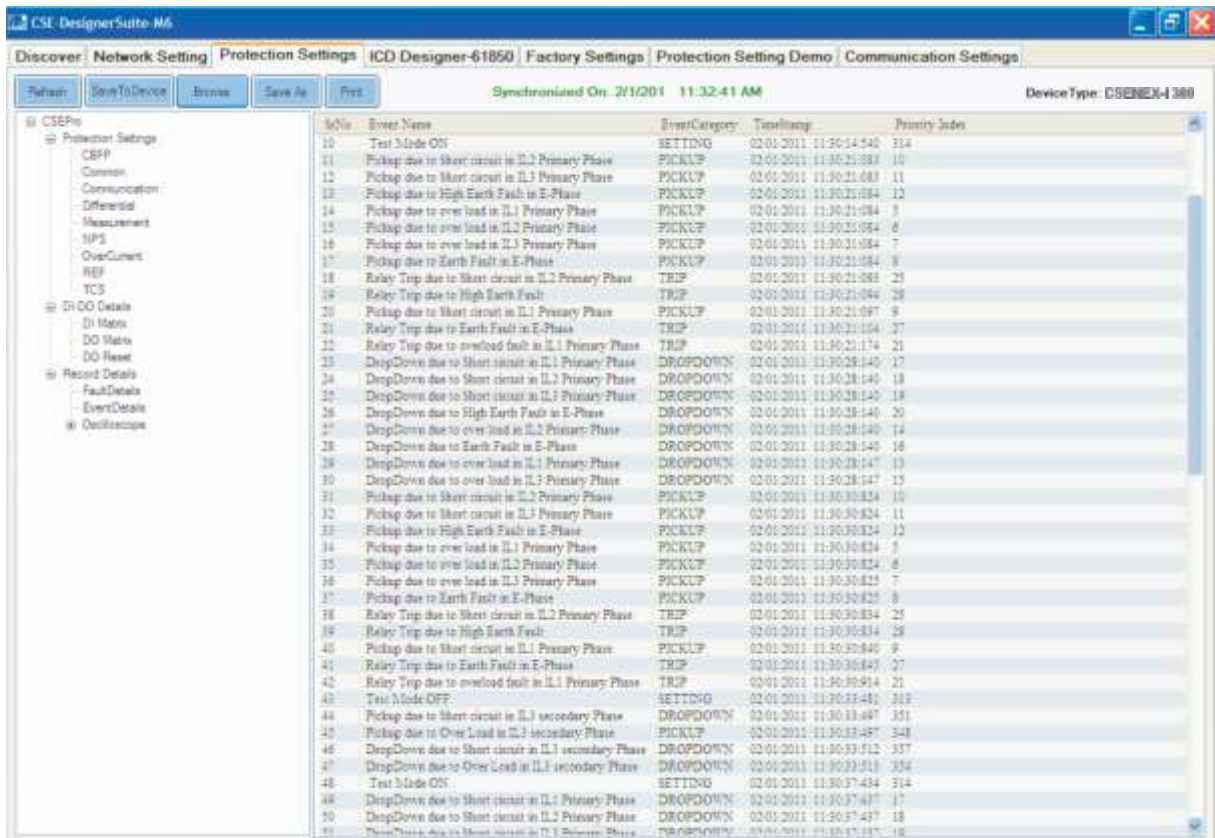
The unit stores in non volatile memory the last 500 events. When the available memory space is exhausted, the new event automatically overwrites the oldest event which can be retrieved from a PC, with the following format:

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

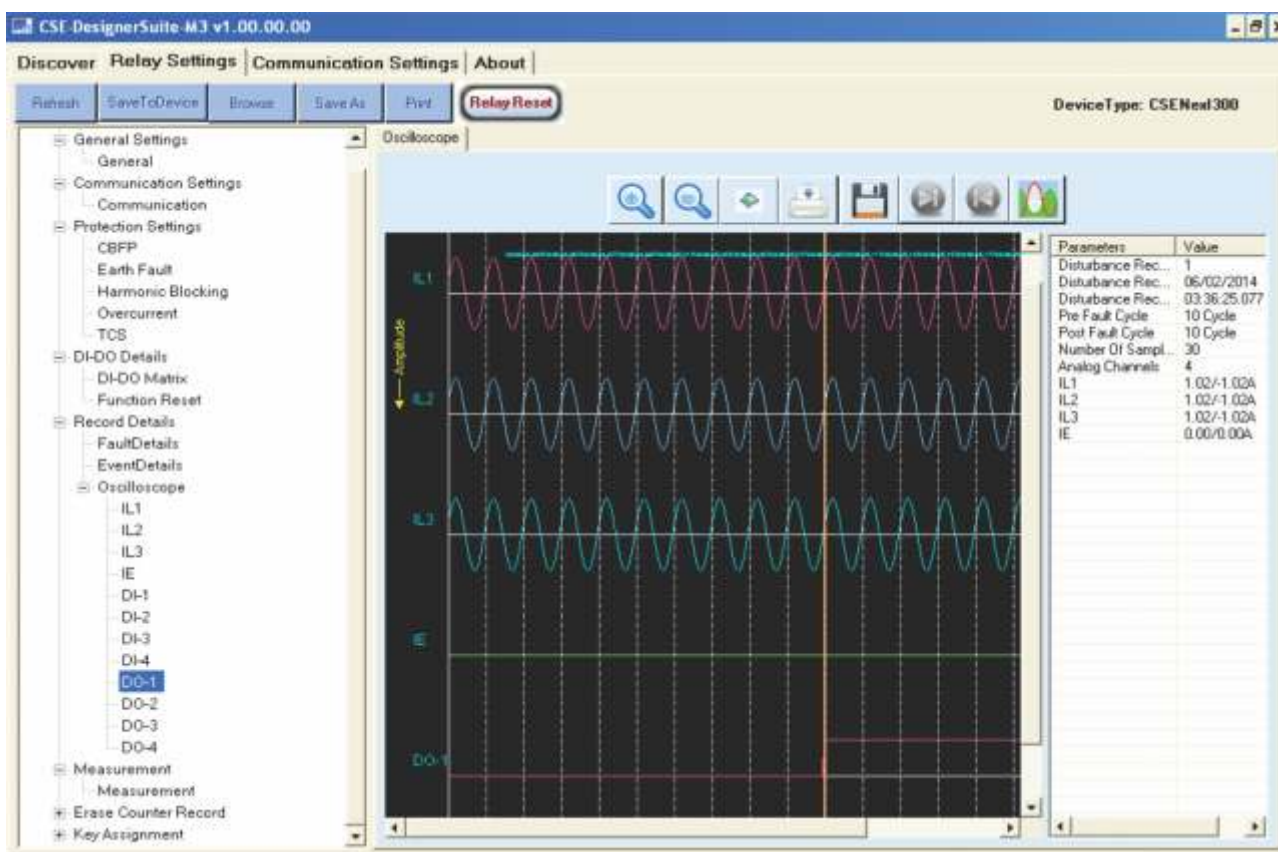


S/No	Event Name	Event Category	Timestamp	Priority Index
10	Test Mode ON	SETTING	02/01/2011 11:30:14:540	314
11	Pickup due to Short circuit in IL3 Primary Phase	PICKUP	02/01/2011 11:30:21:083	10
12	Pickup due to Short circuit in IL3 Primary Phase	PICKUP	02/01/2011 11:30:21:083	11
13	Pickup due to High Earth Fault in E-Phase	PICKUP	02/01/2011 11:30:21:084	12
14	Pickup due to over load in IL1 Primary Phase	PICKUP	02/01/2011 11:30:21:084	5
15	Pickup due to over load in IL3 Primary Phase	PICKUP	02/01/2011 11:30:21:084	6
16	Pickup due to over load in IL3 Primary Phase	PICKUP	02/01/2011 11:30:21:084	7
17	Pickup due to Earth Fault in E-Phase	PICKUP	02/01/2011 11:30:21:084	8
18	Relay Trip due to Short circuit in IL3 Primary Phase	TRIP	02/01/2011 11:30:21:083	25
19	Relay Trip due to High Earth Fault	TRIP	02/01/2011 11:30:21:084	26
20	Pickup due to Short circuit in IL1 Primary Phase	PICKUP	02/01/2011 11:30:21:097	9
21	Relay Trip due to Earth Fault in E-Phase	TRIP	02/01/2011 11:30:21:094	27
22	Relay Trip due to overload fault in IL1 Primary Phase	TRIP	02/01/2011 11:30:21:174	21
23	DropDown due to Short circuit in IL1 Primary Phase	DROPDOWN	02/01/2011 11:30:28:140	17
24	DropDown due to Short circuit in IL3 Primary Phase	DROPDOWN	02/01/2011 11:30:28:140	18
25	DropDown due to Short circuit in IL3 Primary Phase	DROPDOWN	02/01/2011 11:30:28:140	18
26	DropDown due to High Earth Fault in E-Phase	DROPDOWN	02/01/2011 11:30:28:140	20
27	DropDown due to over load in IL2 Primary Phase	DROPDOWN	02/01/2011 11:30:28:140	14
28	DropDown due to Earth Fault in E-Phase	DROPDOWN	02/01/2011 11:30:28:140	16
29	DropDown due to over load in IL1 Primary Phase	DROPDOWN	02/01/2011 11:30:28:147	13
30	DropDown due to over load in IL3 Primary Phase	DROPDOWN	02/01/2011 11:30:28:147	15
31	Pickup due to Short circuit in IL3 Primary Phase	PICKUP	02/01/2011 11:30:30:824	10
32	Pickup due to Short circuit in IL3 Primary Phase	PICKUP	02/01/2011 11:30:30:824	11
33	Pickup due to High Earth Fault in E-Phase	PICKUP	02/01/2011 11:30:30:824	12
34	Pickup due to over load in IL1 Primary Phase	PICKUP	02/01/2011 11:30:30:824	5
35	Pickup due to over load in IL3 Primary Phase	PICKUP	02/01/2011 11:30:30:824	6
36	Pickup due to over load in IL3 Primary Phase	PICKUP	02/01/2011 11:30:30:825	7
37	Pickup due to Earth Fault in E-Phase	PICKUP	02/01/2011 11:30:30:825	8
38	Relay Trip due to Short circuit in IL3 Primary Phase	TRIP	02/01/2011 11:30:30:824	25
39	Relay Trip due to High Earth Fault	TRIP	02/01/2011 11:30:30:824	26
40	Pickup due to Short circuit in IL1 Primary Phase	PICKUP	02/01/2011 11:30:30:840	9
41	Relay Trip due to Earth Fault in E-Phase	TRIP	02/01/2011 11:30:30:845	27
42	Relay Trip due to overload fault in IL1 Primary Phase	TRIP	02/01/2011 11:30:30:914	21
43	Test Mode OFF	SETTING	02/01/2011 11:30:33:481	313
44	Pickup due to Short circuit in IL3 secondary Phase	DROPDOWN	02/01/2011 11:30:33:487	351
45	Pickup due to Over Load in IL3 secondary Phase	PICKUP	02/01/2011 11:30:33:487	348
46	DropDown due to Short circuit in IL3 secondary Phase	DROPDOWN	02/01/2011 11:30:33:512	357
47	DropDown due to Over Load in IL3 secondary Phase	DROPDOWN	02/01/2011 11:30:33:513	354
48	Test Mode ON	SETTING	02/01/2011 11:30:37:434	314
49	DropDown due to Short circuit in IL1 Primary Phase	DROPDOWN	02/01/2011 11:30:37:437	17
50	DropDown due to Short circuit in IL3 Primary Phase	DROPDOWN	02/01/2011 11:30:37:437	18
51	DropDown due to Short circuit in IL3 Primary Phase	DROPDOWN	02/01/2011 11:30:37:437	18

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 6 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.
- ❖ Relay gives max. recording of 24 sec.



- No. of digital outputs : 4 (DO1, DO2, DO3, DO4)
- Type of outputs : Relay
- Programmable (DO Assignment) : Yes
- 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

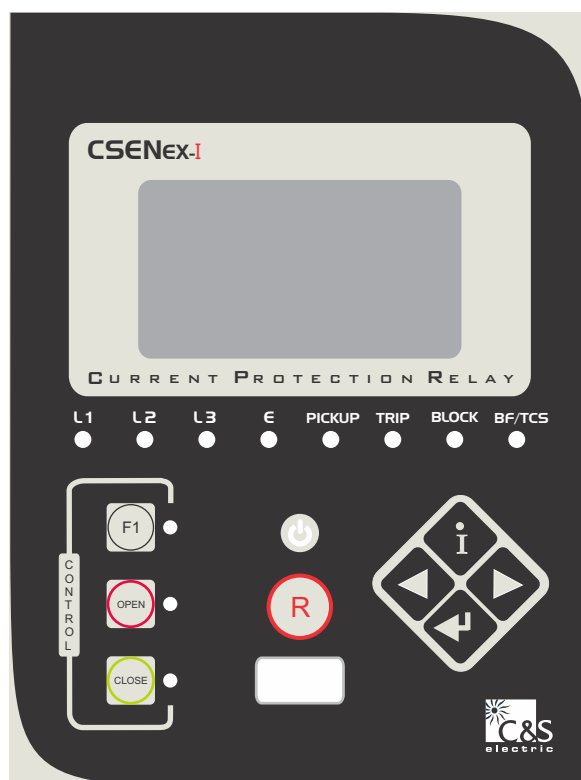
- No of digital inputs : 4 (DI1, DI2, DI3, DI4)
- Programmable (DI Assignment) : Programmable

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 3) (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.

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-I 300-C1 Relay is having four group of protection settings.

All editable settings are password protected.

Active Group Setting

S.No.	Parameters	Display	Setting Range		Step Size	Default Setting
			Min	Max		
1	Active Group	ACTIVE	GROUP1	GROUP4	1	GROUP1

Harmonic Setting

S.No.	Parameter	Display	Setting Range		Step Size	Default Setting
			Min.	Max.		
1	Enable Phase block	PH Block	NO	YES	-----	NO
2	Phase Blocking time	tPHASE	0.0 Sec	20 Sec	0.1	0.0 Sec
3	Enable Earth block	E Block	NO	YES	-----	NO
4	Earth Blocking time	tEARTH	0.0 Sec	20 Sec	0.1	0.0 Sec

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>	0.20xI _p 0.05 Sec 0.01	4.0xI _p 150 Sec 1.50	0.01xI _p 0.01Sec 0.005	Disable 0.10 Sec 0.05
4	Phase over-current hi-set pickup setting Phase over-current hi-set definite timing	I>> t>>	0.5xI _p 0.02 Sec	30xI _p 20 Sec	0.1xI _p 0.01Sec	Disable 0.10 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>	0.05xI _n 0.03 Sec 0.01	2.5xI _n 150 Sec 1.50	0.01xI _n 0.01Sec 0.005	Disable 0.10 Sec 0.05
6	Earth over-current hi-set pickup setting Earth over-current hi-set definite timing	Ie>> te>>	0.5xI _n 0.02 Sec	8xI _n 20 Sec	0.05xI _n 0.01 Sec	Disable 0.10 Sec

Trip Circuit Supervision Protection

S.No.	Parameter	Display	Setting Range		Step Size	Default Setting
			Min.	Max.		
1	Enable TCS	Enable	NO	YES	-----	NO
2	TCS	t_TCS	0.05 Sec	5 Sec	0.01	0.05 Sec

Circuit Breaker Failure Protection

S.No.	Parameter	Display	Setting Range		Step Size	Default Setting
			Min.	Max.		
1	Enable CBFP	Enable	NO	YES	-----	NO
2	CBFP	t_CBFP	0.05 Sec	5 Sec	0.01	0.05 Sec

Auto Recloser Setting

S.No.	Parameters	Display	Setting Range		Step Size	Default Setting
			Min	Max		
1	Blocking of Auto-recloser	ENABLE	NO	YES	-	NO
2	Set Dead Time-1	D1	0.2 Sec	300 Sec	0.01 Sec	0.2 Sec
3	Set Dead Time-2	D2	0.2 Sec	300 Sec	0.01 Sec	0.2 Sec
4	Set Dead Time-3	D3	0.2 Sec	300 Sec	0.01 Sec	0.2 Sec
5	Set Dead Time-4	D4	0.2 Sec	300 Sec	0.01 Sec	0.2 Sec
6	Set Reclaim Time	tR	0.2 Sec	300 Sec	0.01 Sec	0.2 Sec
7	Cycle I>	Cycle I>	2	4/Disable	1	2
8	Cycle I>>	Cycle I>>	2	4/Disable	1	2
9	Cycle Ie>	Cycle Ie>	2	4/Disable	1	2
10	Cycle Ie>>	Cycle Ie>>	2	4/Disable	1	2
11	Trip sense time	t_TST	0.05 Sec	2 Sec	0.01Sec	0.05 Sec

Cold Load Pickup Setting

S.No.	Parameter	Display	Min	Max	Step Size	Default setting
1	Cold Load Pickup enable	CLP PKUP	Enable	Disable	----	Disable
2	Cold Load Time	tcold	0.00s	100.00s	0.01s	0.10s
3	Cold Load Actuation Time	tcip	0.00s	100.00s	0.01s	0.10s

DO Assignment

S.No.	Parameters	Display
1	Over current protection	I>
2	Short circuit stage1 protection	I>>
3	Earth protection	le>
4	Earth high protection	le>>
5	Trip circuit supervision	TCS
6	Circuit breaker failure protection	CBFP
7	Self supervision	SELF SUP
8	Auto reclose	AR CLOSE
9	Autro reclose lockout	Arlckout
10	Circuit breaker open	CB open
11	Circuit breaker close	CB close
12	Remote trip	Rmt Trp

DI Assignment

S.No.	Parameters	Display
1	Circuit breaker close	CB Close
2	Circuit breaker open	CB Open
3	Circuit breaker ready	CB Ready
4	Remote trip	Rmt Trip
5	Group toggle	GRP togg
6	Remote reset	RMT RSET
7	Oscillator trigger	OSC Trig
8	Over current block	I>BLK
9	Short circuit block	I>>BLK
10	Earth block	E>BLK
11	Earth high block	E>>BLK
12	Auto re-close block	AR BLK

Function Reset

S.No.	Parameters	Display
1	Over current protection	I>
2	Short circuit protection	I>>
3	Earth protection	le>
4	Earth high protection	le>>
5	Trip circuit supervision	TCS
6	Remote trip	Rmt Trp
7	Auto re-close	AR CLOSE

Key Assignment

S.No.	Parameter	Display	Setting Range		Step Size	Default Setting
			Min.	Max.		
1	Function key	F1	----	----	DO1/DO2/DO3 DO4/Relay Reset	DO1

Erase Record Setting

S.No.	Parameter	Display	Min	Max	Step Size	Default
1	Trip Counter Erase	Trip_cntr	NO	YES	-----	NO
2	Event Erase	EventsErase	NO	YES	-----	NO
3	Fault Erase	FaultsErase	NO	YES	-----	NO
4	Oscilloscope Record Erase	OscRcrdErase	NO	YES	-----	NO

Oscilloscope (Disturbance) Record Setting

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

Date & time Record

S.No.	Parameter	Display	Setting Range		Step	Default
1	Hour	HOUR	00	23	1	-----
2	Minute	MIN	00	59	1	-----
3	Second	SEC	00	59	1	-----
4	Date	DATE	01	31	1	-----
5	Day	DAY	SUN	SAT	1	-----
6	Month	MONTH	01	12	1	-----
7	Year	YEAR	00	99	1	-----

Common 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 A	5.00 A	-----	1.00 A
2	Rated earth current	In	1.00 A	5.00 A	-----	1.00 A
3	Phase CT ratio	PhCTRtio	001	9999	001	001
4	Earth CT ratio	ECTRATIO	001	9999	001	001
5	Nominal frequency	FREQ (Fn)	50Hz	60Hz	-----	50Hz
6	Fault Status	[F]Stat	Enable	Disable	-----	Enable

Rear port communication setting

RS-485 Communication	
Protocol	MODBUS RTU/ IEC-103
Baud rate selection (programmable)	9600/19200/38400bps
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 24V AC/DC
Power Consumption		Quiescent approx. 3W Operating approx. <7W

Measurement Accuracy

S.No	Quantity	Range	Frequency Range	Accuracy
1	Current	1 - 30 xIn	50 - 60 Hz	±2%

Pickup Accuracy

S.No	Quantity	Range	Frequency Range	Accuracy
1	Current	1 - 30 xIn	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): $250 \times I_p$ for 1 Sec : $100 \times I_p$ for 10 Sec : $30 \times I_p$ continuously : $4 \times I_p$

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 ($\cos\theta \leq 0.6$) 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

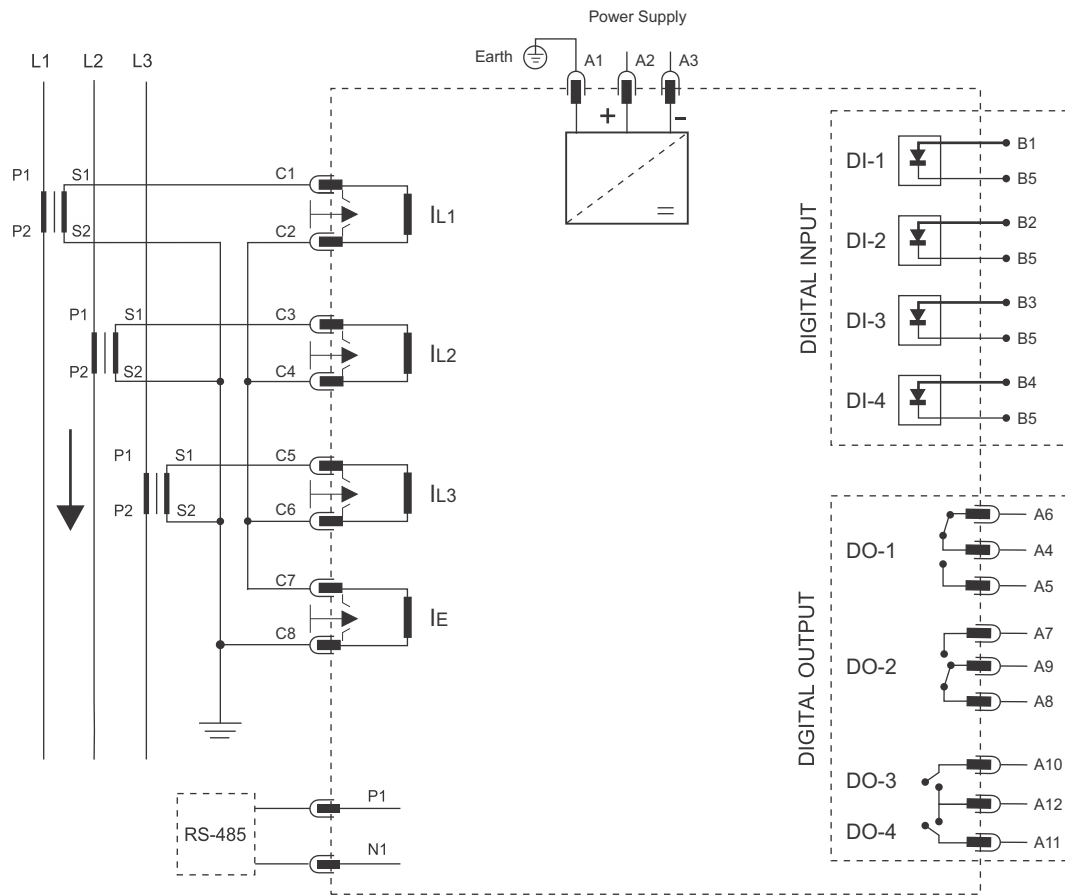
DESIGN STANDARD	
Specified ambient service temp. range	VDE 04355 part 303, IEC 255-4, BS 142
For storage	40 deg C to + 85 deg C
For operation	-20 deg C to 70 deg C
Environmental protection class 'F' as per DIN 40040 and per DIN IEC 68, part 2.3	relative humidity 95% at 40 deg C for 56 days.
Isolation 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 μ s, 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) Mechanical 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) Connection Diagram

CSENEX-I 300-C1

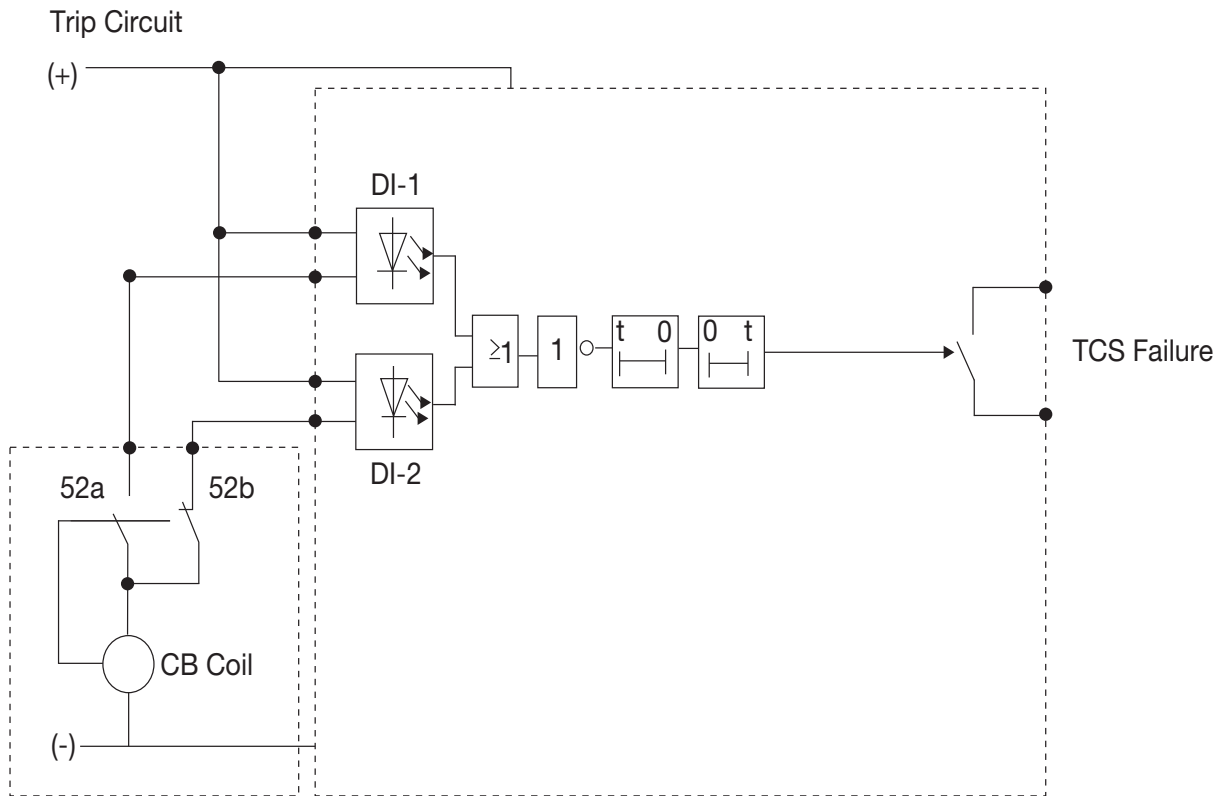


(Figure 4)

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

17) Trip circuit supervision



(Figure 5)

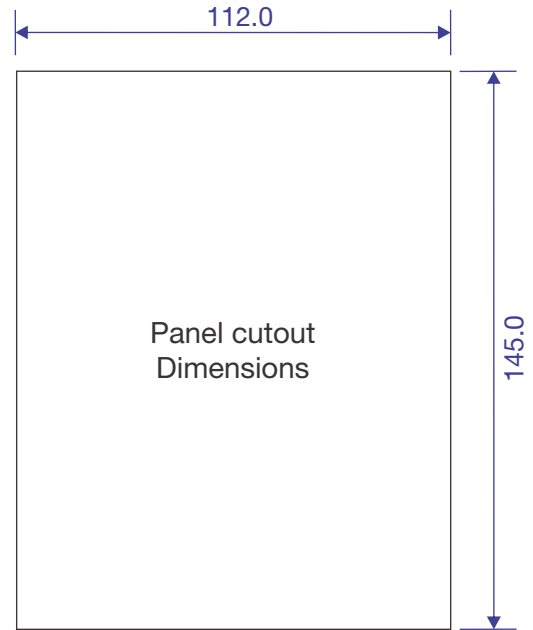
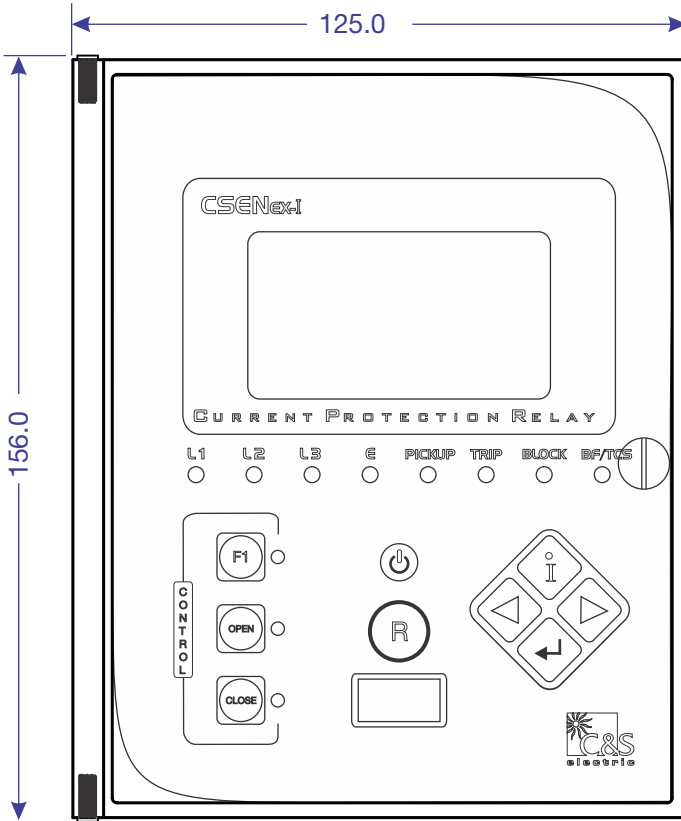
(Note: CB coil resistance should be such that at least 4mA current must flow in each Digital Input)

18) Dimensional Details

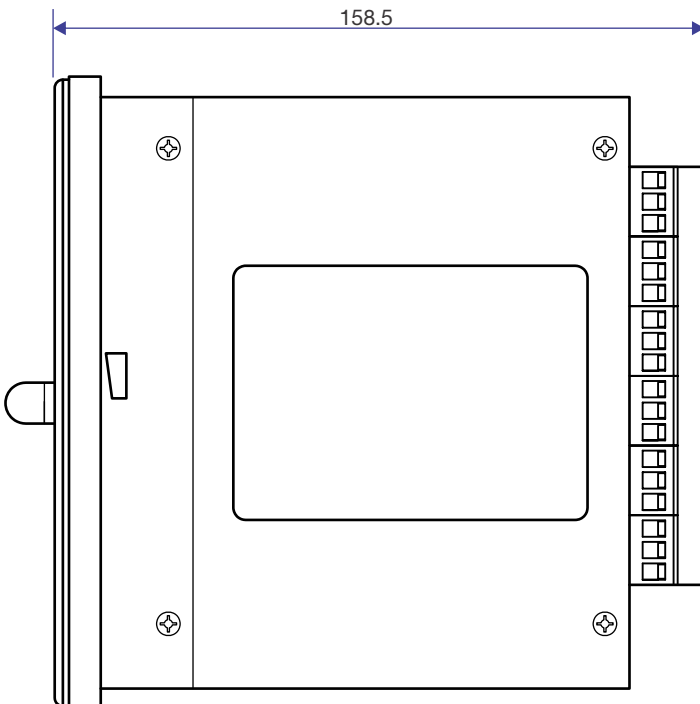
Panel cutout dimension : WxH = 112.0x145.0mm

Weight : 1.5 Kg

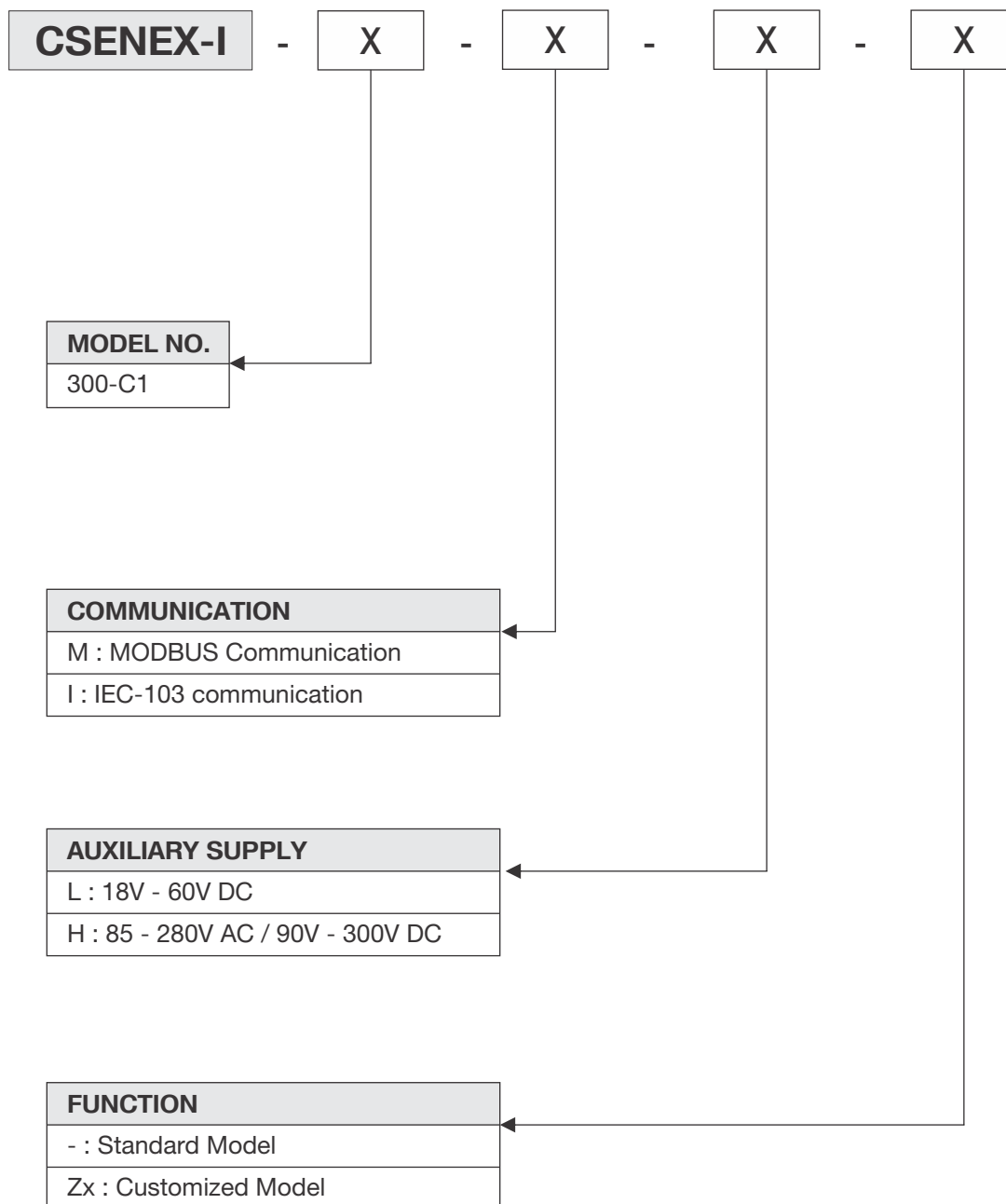
Front View



Side View



19) Ordering Information



Revision History

S.No.	Rev.No.	Details	Date
01	01	Change in Office address on the last page	12.06.15
02	02	Inclusion in data in Features & Protection Features	03.07.15
03	03	Change in TCS Diagram	07.09.15

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 Rev. No: 03
 Rev. Date: 07.09.15

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