

# RefleX Protection and Control

RefleX - 1501

Overcurrent protection  
IEC 60 870-5-103 F/O interface



3-stage OC

Model 1501

# Reflex Three Stage Overcurrent Protection

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## Menu (setting group #1)

<pre> OC IL1      124A IL2      120A IL3      123A           </pre>		<pre> In-service display Primary current I1 Primary current I2 Primary current I3           </pre>
<pre> Trip records           </pre>	(See separate description of the sub-menu 'Trip Records')	<pre> Press 'enter' to display recorded data After selecting a record use 'arrow up' or 'arrow down' to display additional information. Leave monitor by pressing 'Esc'.           </pre>
<pre> Low current #1 I&gt; 160/4A t&gt; 1.5s Def.t CT 200/5A In5A           </pre>	<hr/> <hr/> <hr/>	<pre> Low phase current      Setting group # Primary/secondary current set value Delay                  Characteristic Primary/secondary CT   Rated phase current           </pre>
<pre> Med. current #1 I&gt;&gt; 800/20A t&gt;&gt; 0.5s Def.t CT 200/5A In5A           </pre>	<hr/> <hr/> <hr/>	<pre> Medium phase current   Setting group # Primary/secondary current set value Delay                  Characteristic Primary/secondary CT   Rated phase current           </pre>
<pre> High current #1 I&gt;&gt;&gt; 1200/30A t&gt;&gt;&gt; 0.05s Def.t CT 200/5A In5A           </pre>	<hr/> <hr/> <hr/>	<pre> High phase current     Setting group # Primary/secondary current set value Delay                  Characteristic Primary/secondary CT   Rated phase current           </pre>
<pre> Comm. IEC ON Config. Ring Address 1 Meas. Value 1.2           </pre>	<hr/> <hr/> <hr/>	<pre> Configuration          Comm. On/Off Relay address Value of measurand           </pre>
<pre> YMD 2002-05-29 HMS 13:52:36 Password **** Freq. 50Hz           </pre>	<hr/> <hr/> <hr/>	<pre> Year - month - day 24 hour clock Four-digit password    Factory default: 1111 Rated power system frequency           </pre>

# Reflex Three Stage Overcurrent Protection

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## Menu (setting group #2)

<pre> OC IL1      124A IL2      120A IL3      123A           </pre>		In-service display Primary current I1 Primary current I2 Primary current I3
<pre> Trip records           </pre>	(See separate description of the sub-menu 'Trip Records')	Press 'enter' to display recorded data After selecting a record use 'arrow up' or 'arrow down' to display additional information. Leave monitor by pressing 'Esc'.
<pre> Low current #2 I&gt; 160/4A t&gt; 1.5s Def.t CT 200/5A In5A           </pre>	<hr/> <hr/> <hr/>	Low phase current      Setting group # Primary/secondary current set value Delay                      Characteristic Primary/secondary CT      Rated phase current
<pre> Med. current #2 I&gt;&gt; 800/20A t&gt;&gt; 0.5s Def.t CT 200/5A In5A           </pre>	<hr/> <hr/> <hr/>	Medium phase current      Setting group # Primary/secondary current set value Delay                      Characteristic Primary/secondary CT      Rated phase current
<pre> High current #2 I&gt;&gt;&gt; 1200/30A t&gt;&gt;&gt; 0.05s Def.t CT 200/5A In5A           </pre>	<hr/> <hr/> <hr/>	High phase current      Setting group # Primary/secondary current set value Delay                      Characteristic Primary/secondary CT      Rated phase current
<pre> Comm. IEC ON Config. Ring Address 1 Meas. Value 1.2           </pre>	<hr/> <hr/> <hr/>	Configuration              Comm. On/Off Relay address Value of measurand
<pre> YMD 2002-05-29 HMS 13:52:36 Password **** Freq. 50Hz           </pre>	<hr/> <hr/> <hr/>	Year - month - day 24 hour clock Four-digit password      Factory default: 1111 Rated power system frequency

# RefleX Three Stage Overcurrent Protection

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## Trip records

After a relay trip the display showing date and time of the trip automatically appears.

Each trip is automatically assigned a separate serial number.

All displays show recordings subsequent to relay tripping. The last five recordings are always stored.

By using arrow up/arrow down the user may access all relevant information in the displays below.

Only trip records (displays) with active information is stored and/or displayed after a trip.

```
Trip records
```

This display is part of the main menu  
After selecting a record use 'arrow up' or 'arrow down' to display additional information.  
Leave trip records by pressing 'Esc'.

```
Trip 333  
2002-12-24  
12:13:14.123  
Delay 0.05s
```

Header (in this case looking at trip no. 333)  
Date of 'trip 333'  
Time of 'trip 333'  
Delay of 'trip 333'

```
Trip 333  
I> I>> I>>>*
```

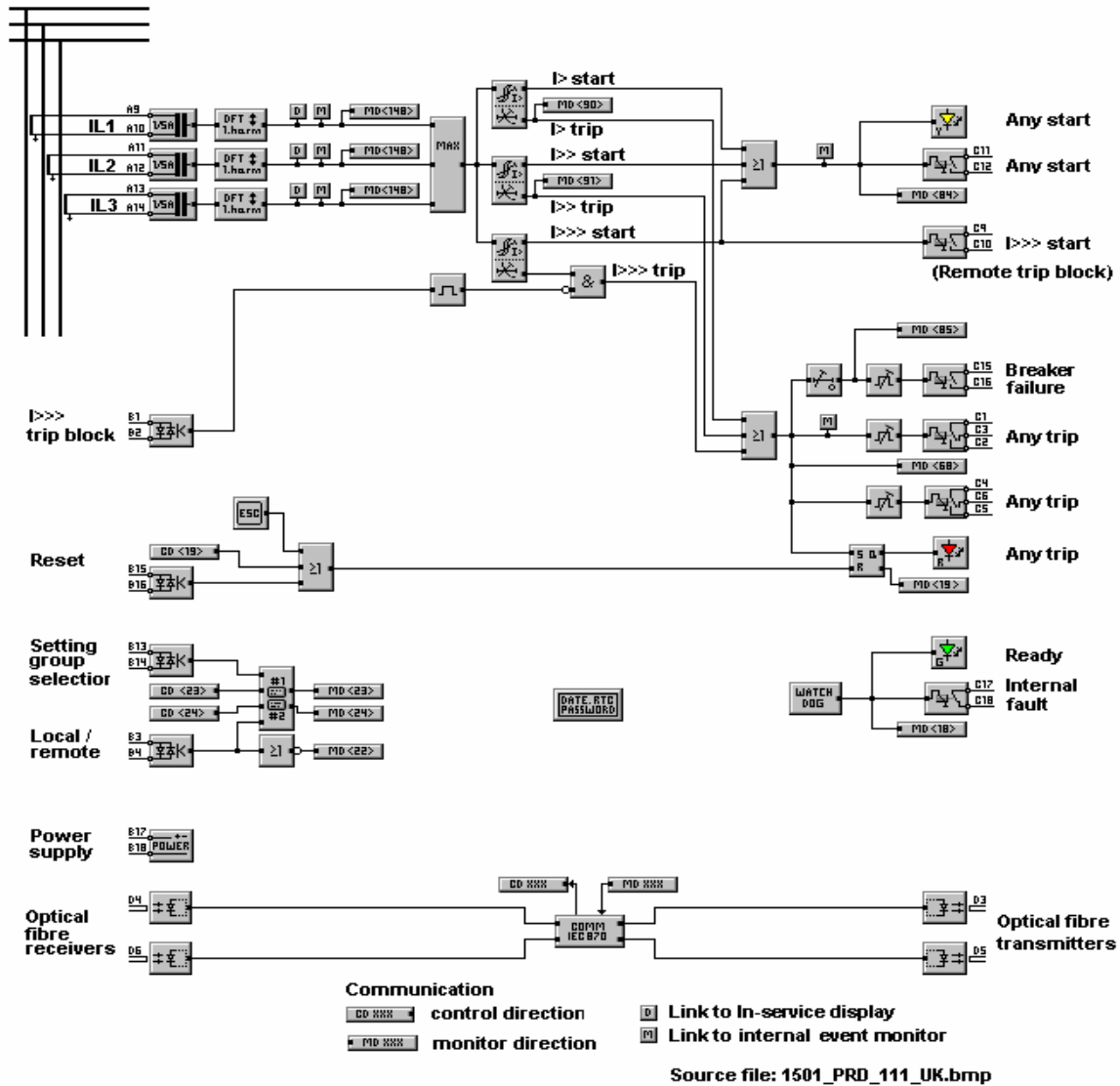
Trip 333  
\* indicates type of trip

```
Trip 333  
IL1      1400A  
IL2      1390A  
IL3      1400A
```

Trip 333  
Primary phase current  
Primary phase current  
Primary phase current

# RefleX Three Stage Overcurrent Protection

## Logic diagram



# RefleX Three Stage Overcurrent Protection

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## Technical data

### Overcurrent protection

Measurement	Three phases
Current settings 1A rated input.	I>, I>>,I>>> 0.200 - 75.0 A and block
Current settings 5A rated input.	I>, I>>,I>>> 1.00 - 375 A and block
Time characteristics	NI, VI, EI, LTI and def. time
Time multipliers k at inverse time characteristics	k>,k>>,k>>> 0.05 - 1.20 and block
Definite time settings	t>,t>>,t>>> 0.01 - 9.99 s and block
Resetting ratio	>0.97
Harmonic measurement	1st harmonic

### Breaker failure protection

Trip transfer delay (fixed value)	0.2 s
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### Selection between two setting groups

Setting group #1 is active when 'low' input voltage is applied to Setting group #1 can also be selected by signal from comm.	Input B13-B14 <CD 23>
Setting group #2 is active when 'high' input voltage is applied to Setting group #2 can also be selected by signal from comm.	Input B13-B14 <CD 24>
Setting group is selected by communication when 'high' input voltage is applied to	Input B3-B4

### System data

Factory default password	1111
Pulse-extension circuit on all trip outputs	0.2 s pulse
Pulse-extension circuit at blocking inputs	50 ms pulse
Rated frequency	50 / 60 Hz

# RefleX Three Stage Overcurrent Protection

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## Technical data

### Communication (IEC 60 870-5-103 protocol)

Configuration system	Star or Ring
Address of protection equipment	1 to 254
Value of measurand ( x In)	1.2 or 2.4
Optical fibre transmitters	Outputs D3,D5
Optical fibre receivers	Inputs D4,D6

### Selection of standard information numbers in monitor direction (MDxxx)

Protection inactive (internal fault)	<18>
LED-reset	<19>
Local parameter setting	<22>
Characteristic 1 (selected setting group)	<23>
Characteristic 2 (selected setting group)	<24>
General trip	<68>
General start	<84>
Breaker failure	<85>
Trip I>	<90>
Trip I>>	<91>
Measurands IL1,2,3	<148>

### Selection of standard information numbers in control direction (CDxxx)

LED-reset	<19>
Select setting group 1	<23>
Select setting group 2	<24>