ABB

M-T-M Close Transition

This document is intended to describe the components, required inputs and outputs, sequence of operations and the basic logic to implement ABB's transfer scheme for M-T-M applications.

Contents

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Distribution Automation

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Single Line Diagrams

The following is a one line diagram of the connections required to the relays for the implementation of the transfer scheme

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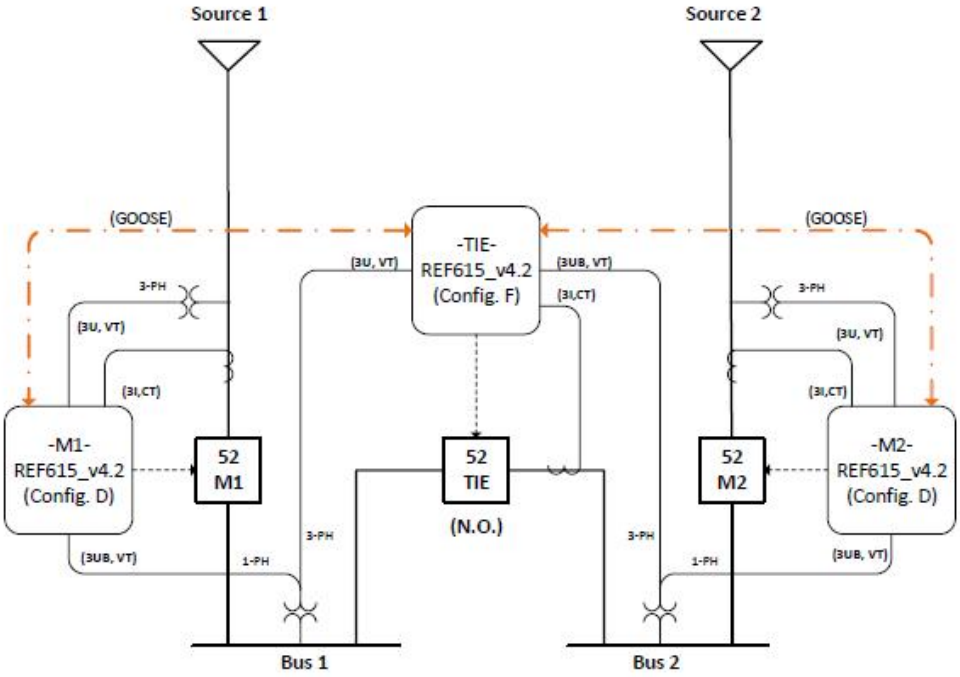
SINGLE LINE DIAGRAM



Schemes: M-T-M Universal/Good Line Seeking, Closed/Open Transition)

Relays: Main 1 Relay Order Code: HAFDDADAFHE5BBN12E
Main 2 Relay Order Code: HAFDDADAFHE5BBN12E
Tie Relay Order Code: HAFFFAFAFHE5BBN12E

Required Inputs

The following inputs to the each relays being used for the transfer scheme are required for the proper operation of this automatic transfer scheme.

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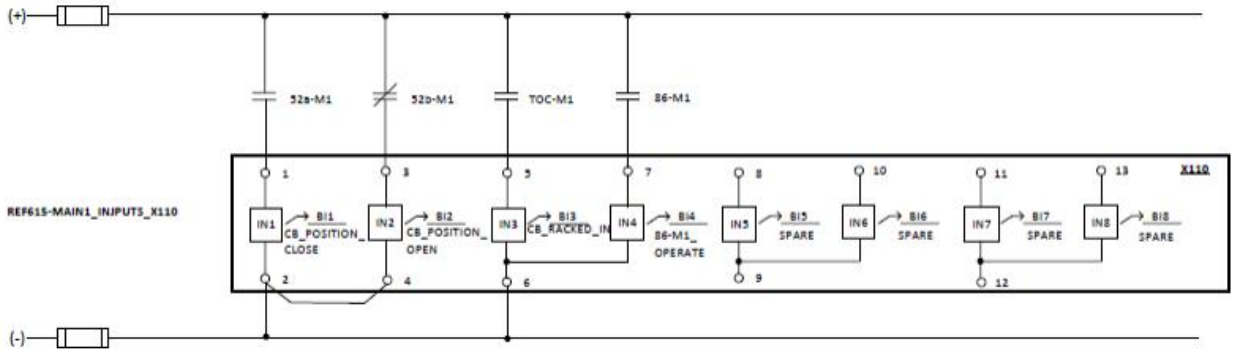
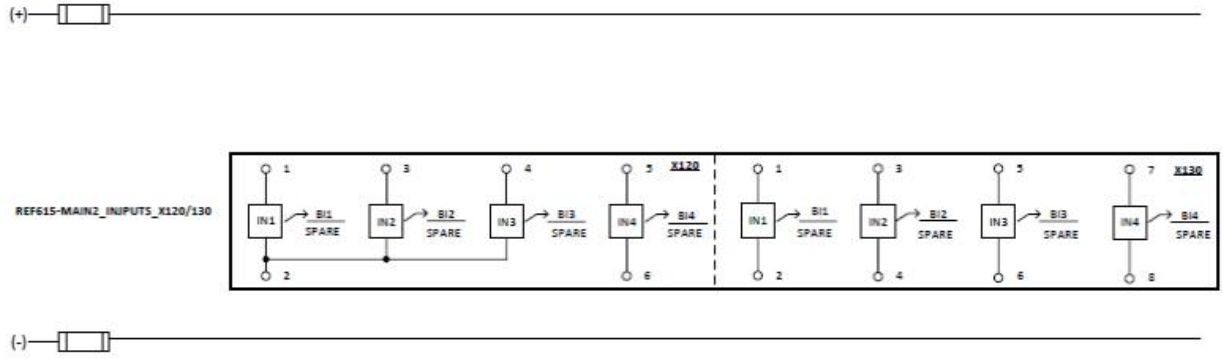
Main 1 Relay



Main 2 Relay



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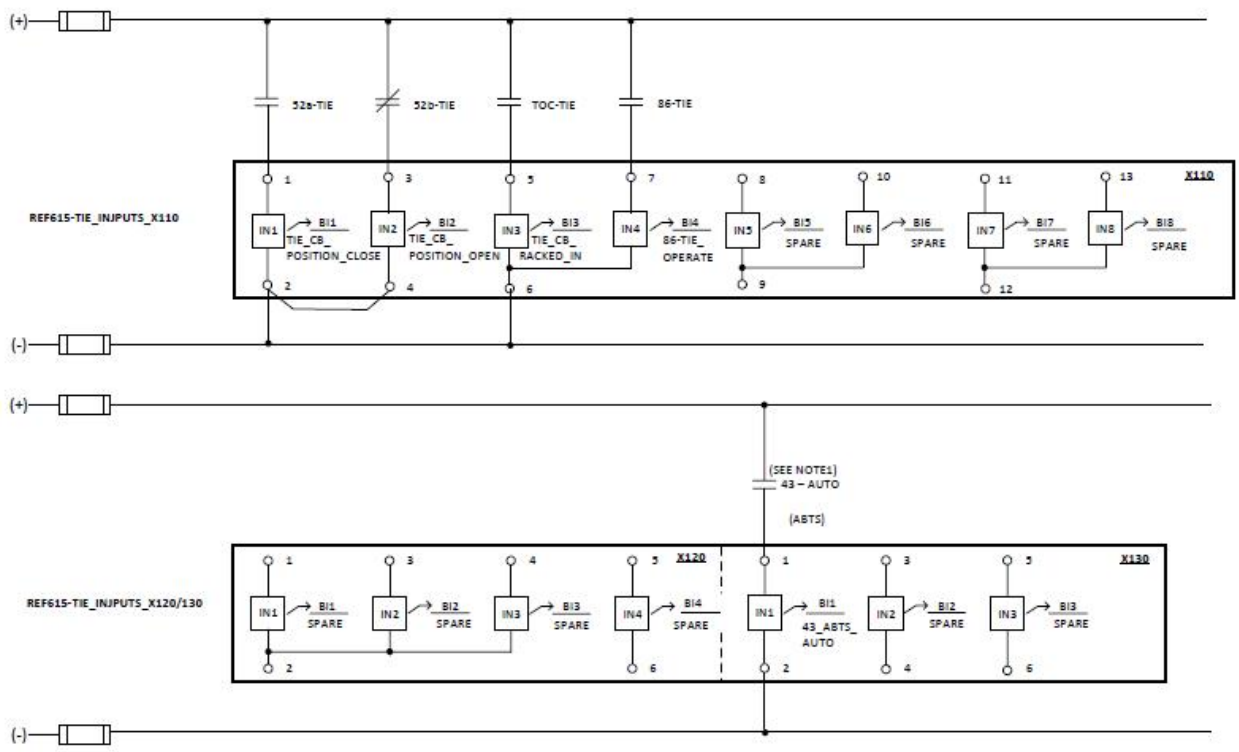
Tie Relay



Required Outputs

The following outputs from each of the relays being used for the transfer scheme are required for the proper operation of this automatic transfer scheme.

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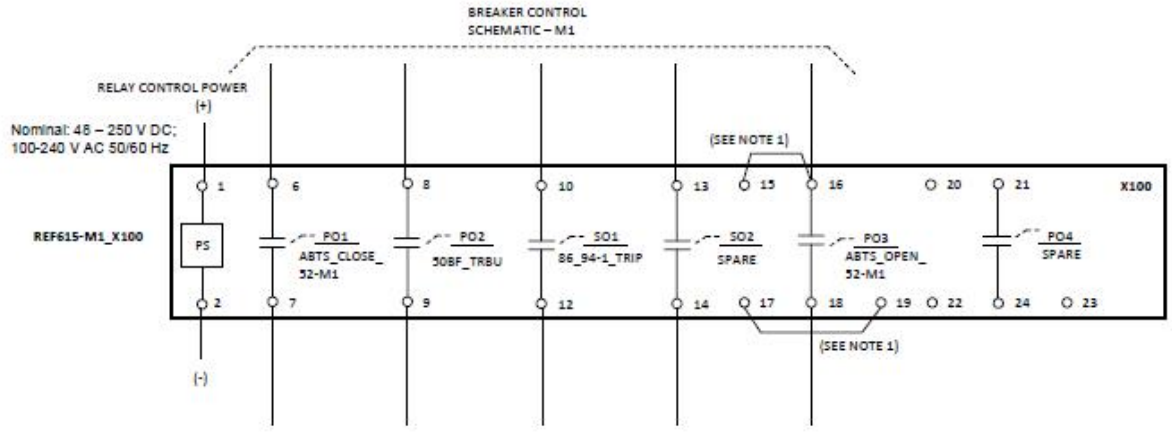
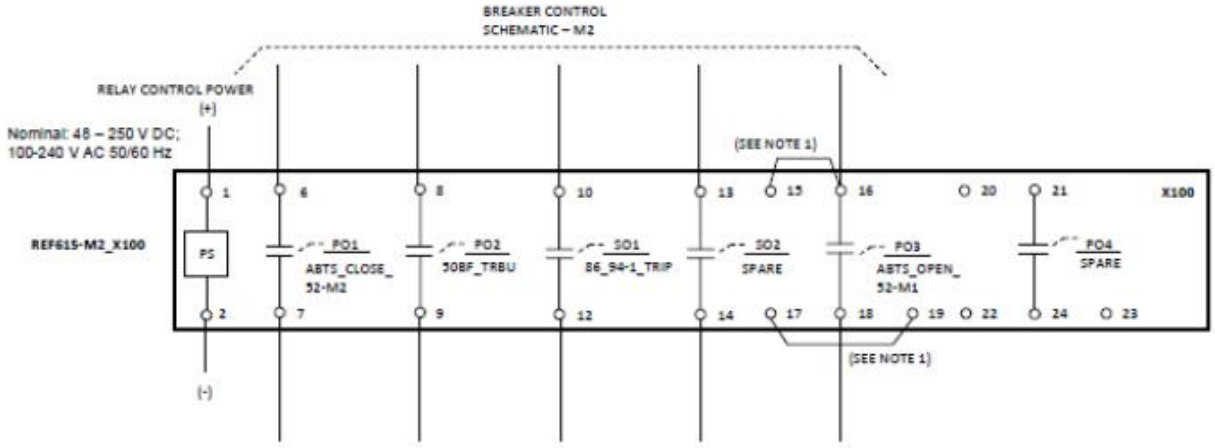
Main Breaker 1



Main Breaker 2



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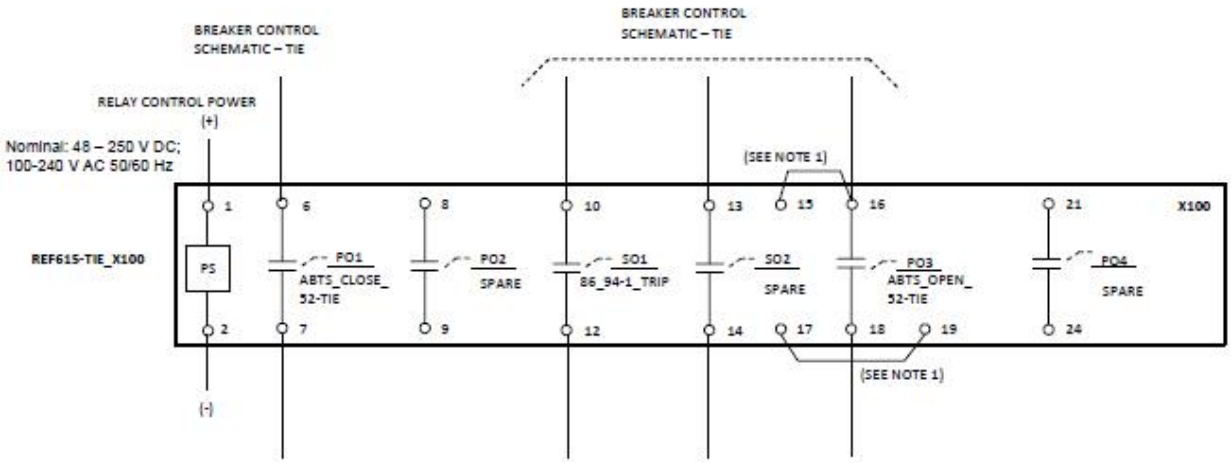
Tie Breaker



Breaker Schematics

The following breaker schematics represent all the connections and electrical interlocks required for the proper operation of the Automatic Transfer Scheme

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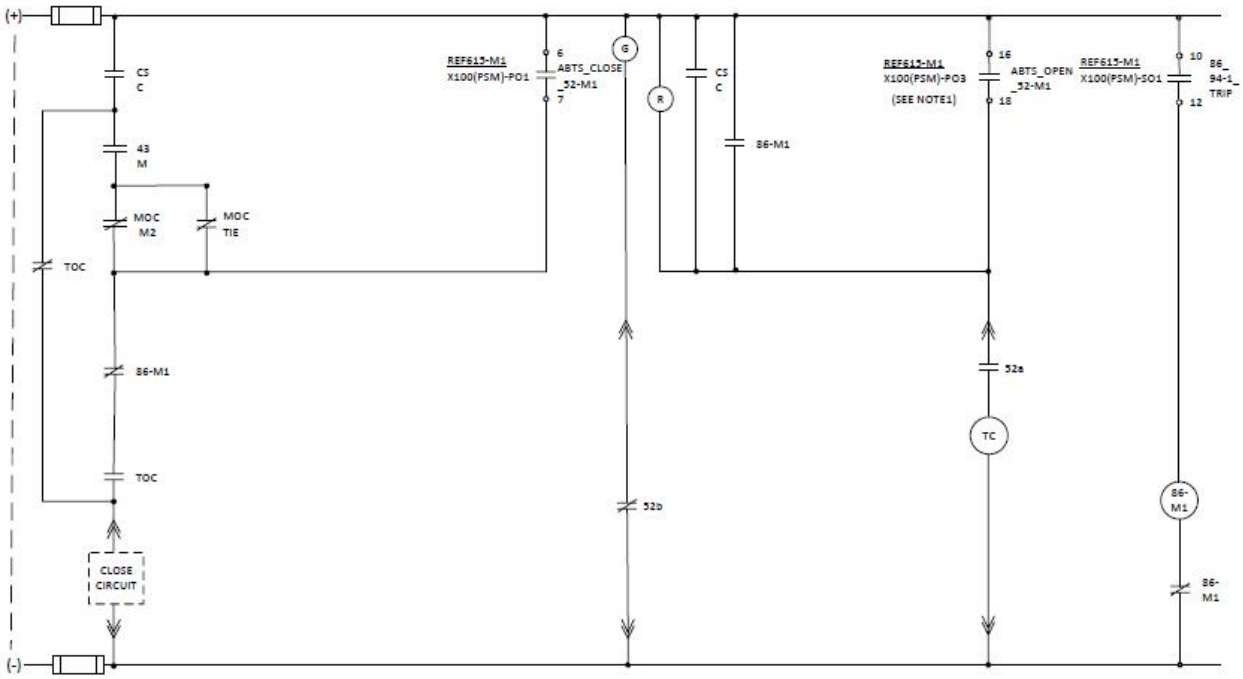
Main Breaker 1



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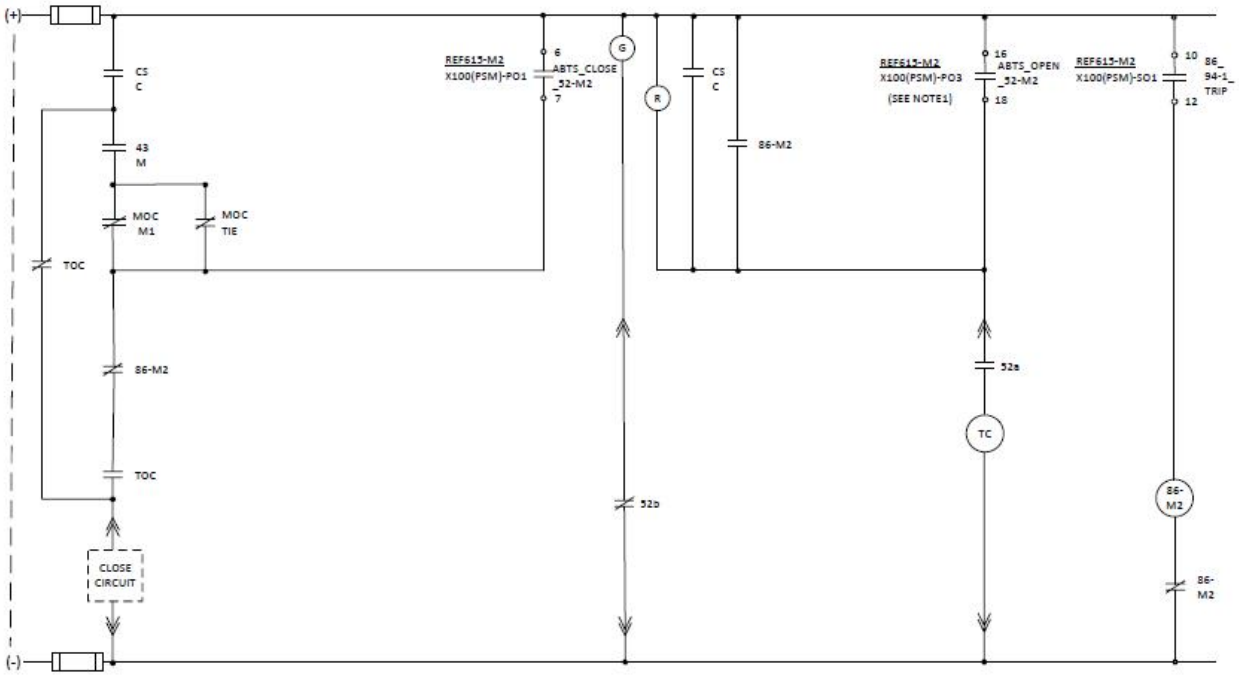
Main Breaker 2



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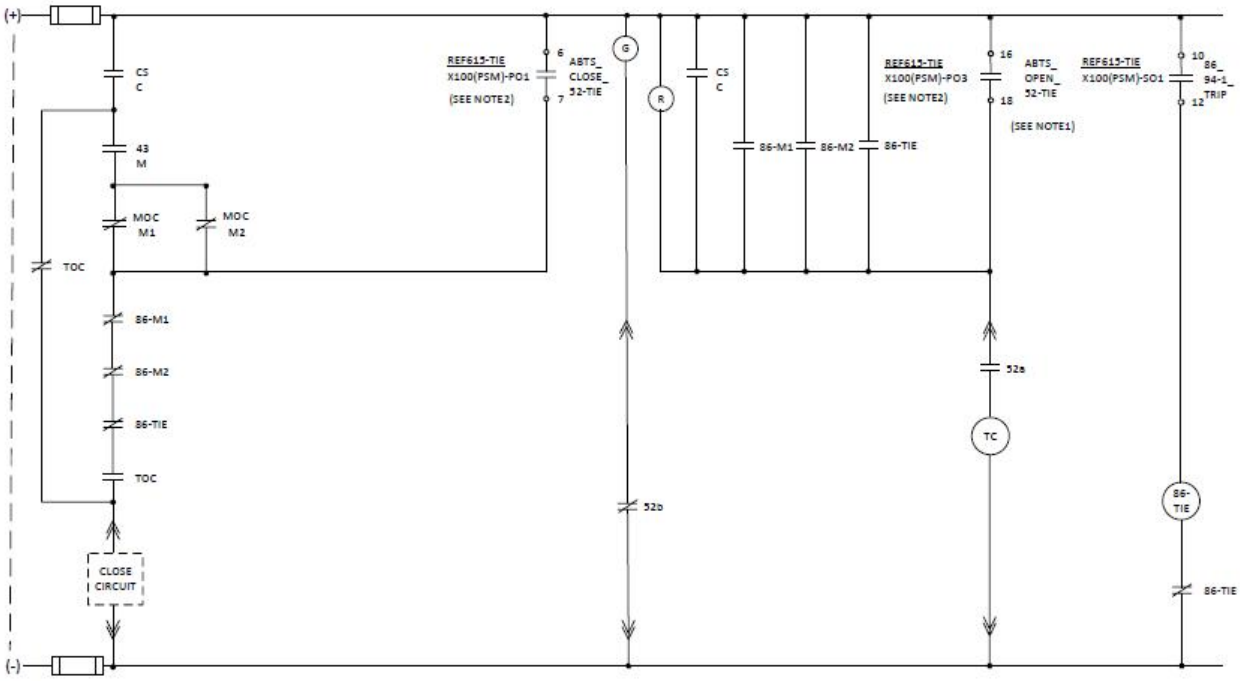
Tie Breaker



The sequence of operations for the ATS scheme would be as follows

Selector Switches

43 M/A Manual/Auto Switch

Describes manual or automatic operation for the transfer scheme

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Normal Mode of Operation

The normal mode of operation would be with device 43 in “Automatic” mode, both incoming lines will be normally closed and tie breaker will be open.

Electrical interlocks

Under manual operation there is an electrical interlock between all incoming sources to prevent paralleling.

Under automatic operation it would only be possible to parallel the incoming sources momentarily if the lines are synchronized.

Automatic Mode

Selector switch device 43 in “Auto”

(a)

Loss of voltage (UV or NEG SEQ) on either incoming line will after a time delay cause its main breaker to open and then the tie breaker will close, provided that voltage is present on the other incoming line.

When the voltage is restored, the main breaker would after a time delay automatically close and then the tie breaker will open.

(b)

However, if the voltage is subsequently lost on the second line after the transfer has occurred as described in (a) above, the second line will after a time delay open and then the tie would open.

Return of voltage on either line will after a time delay cause its main breaker to close, and then the tie would close. When voltage returns to the other line, the main breaker will after a time delay close, and then the tie breaker will open, restoring the system to normal.

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(c)

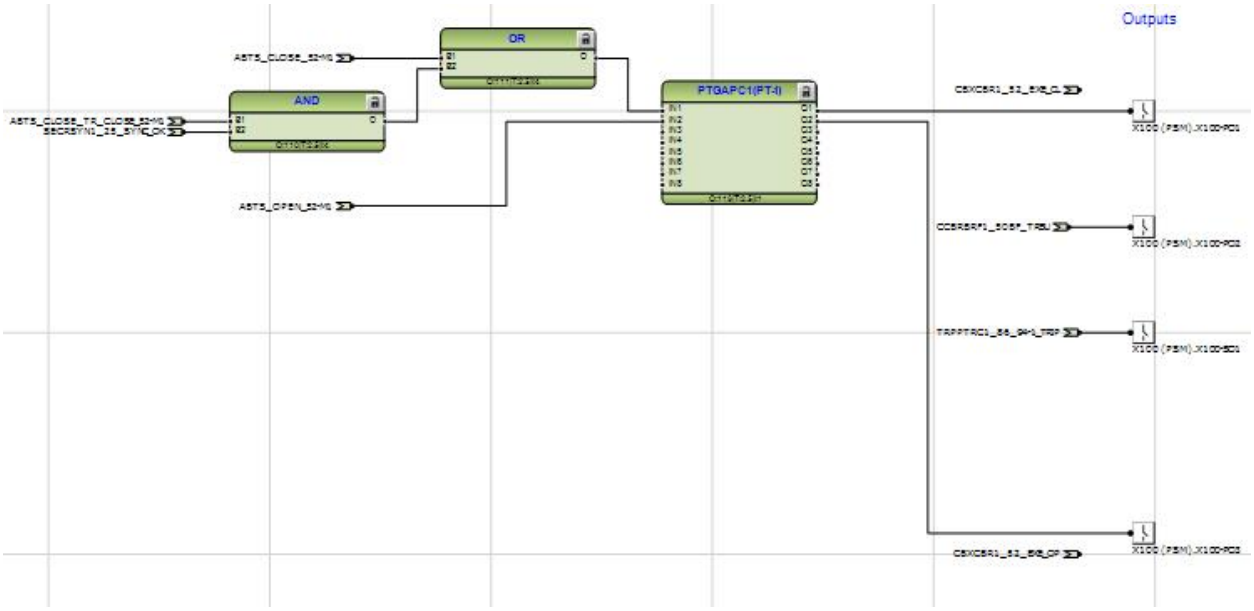
Simultaneous loss (or restoration) of both sources will after a time delay cause both main breakers to open (or close), leaving the tie breaker open.

ATS Logic

The following logic describes what it has been implemented within each of the protective to perform the sequence of operation, as described under the sequence of operation section

Main 1

Close/Open Logic



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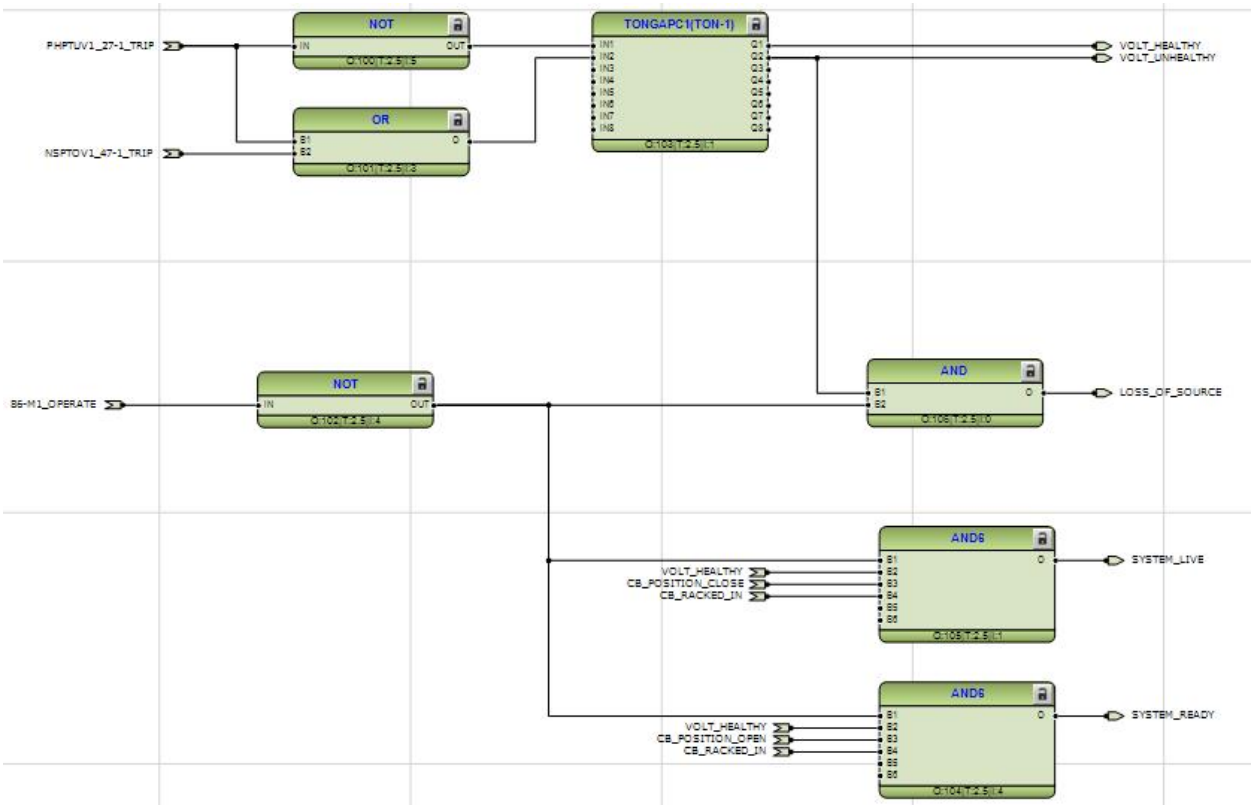
ATS Logic



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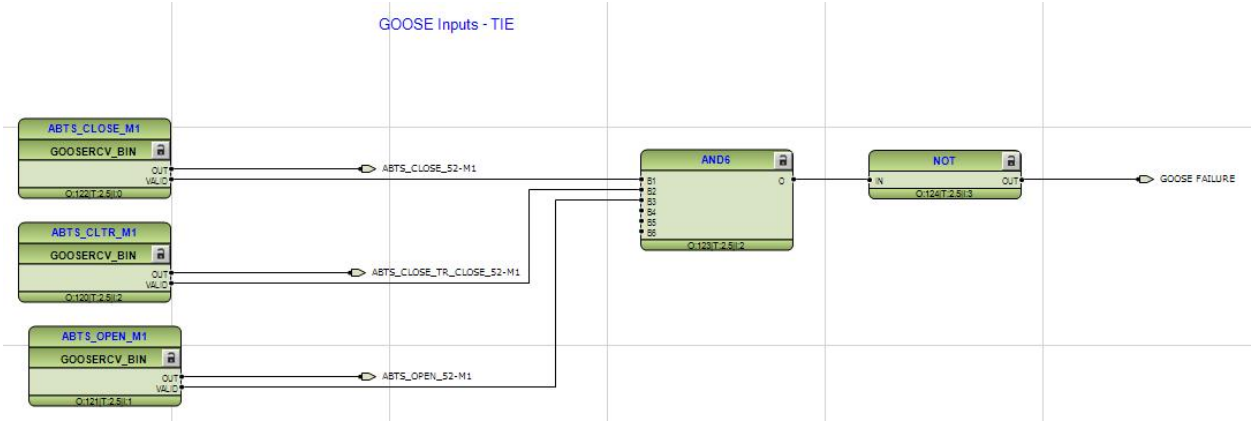
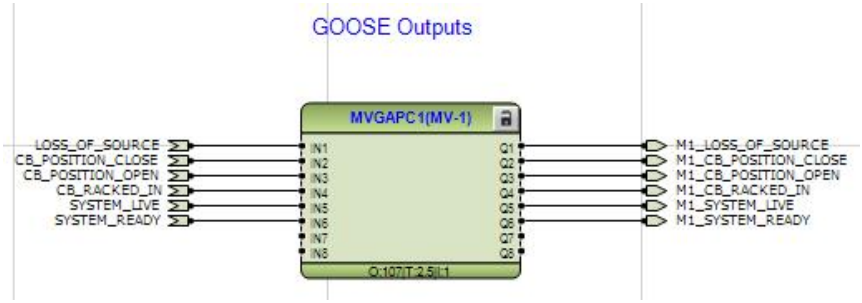
Goose Signals





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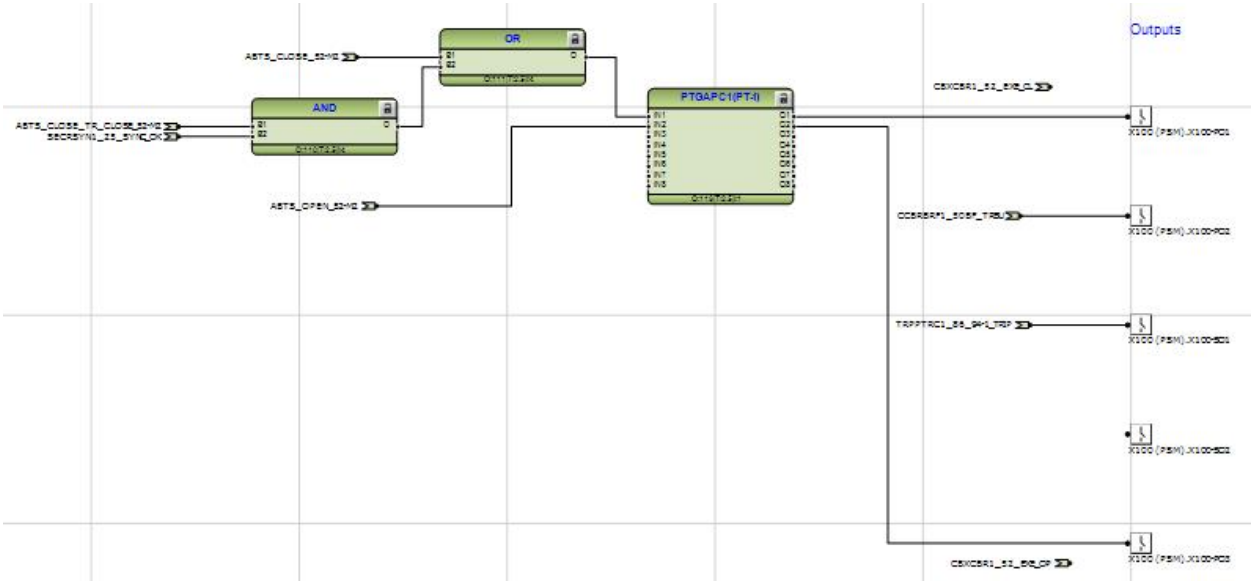
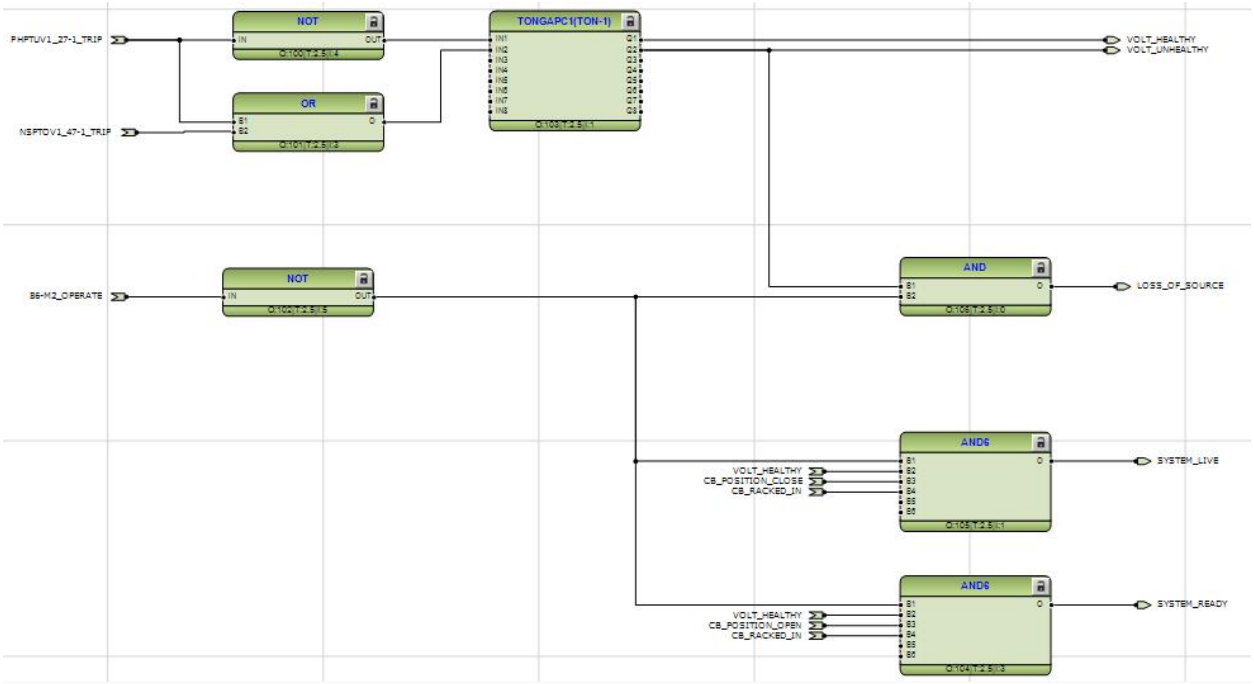
Main 2

Close/Open Logic



ATS Logic



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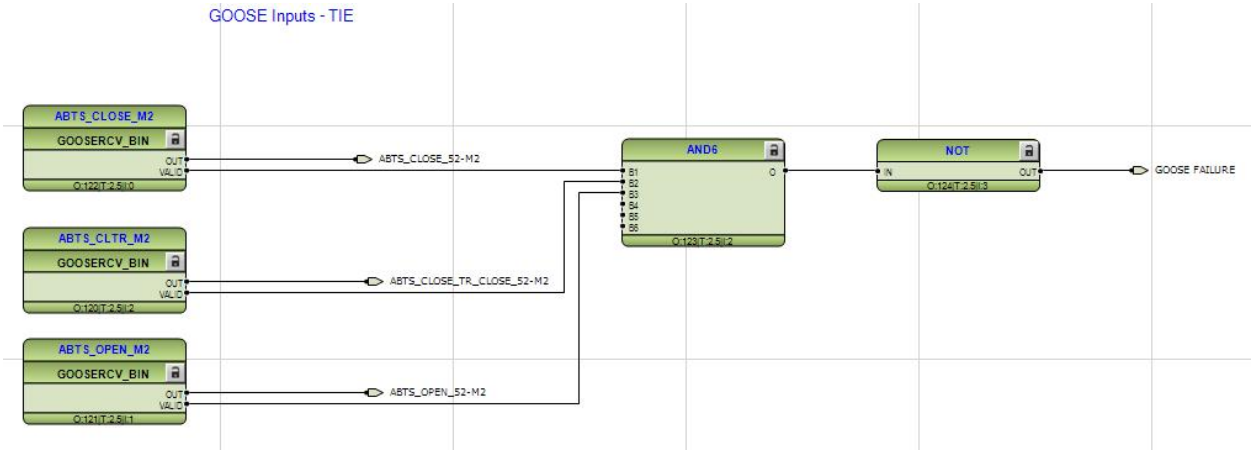
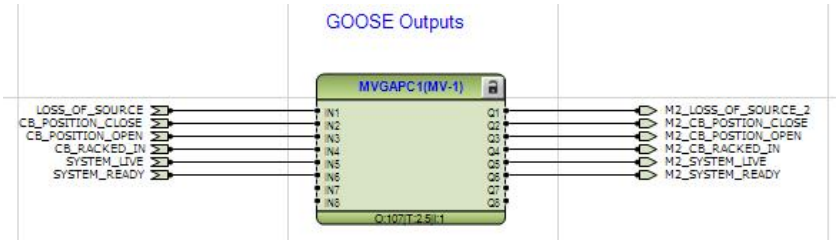
Goose Signals





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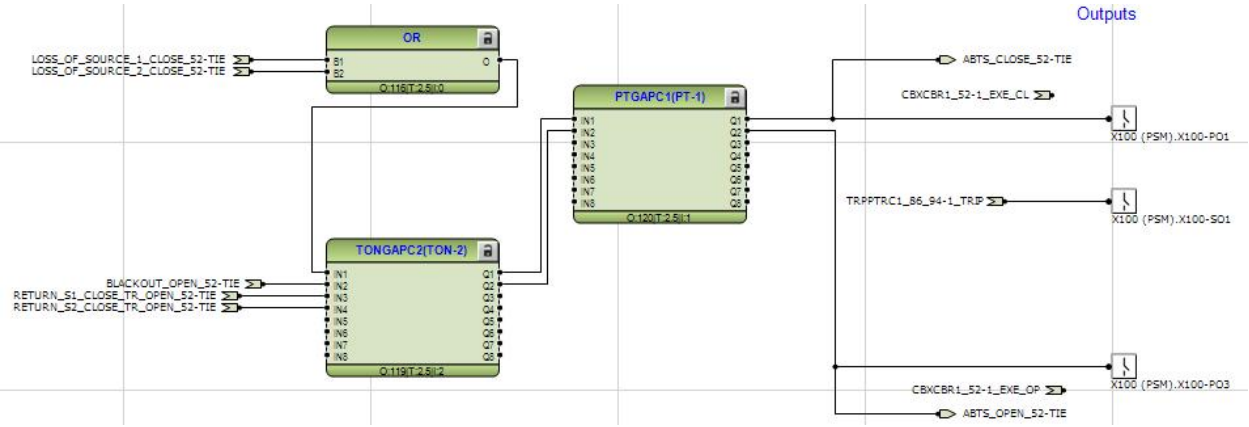
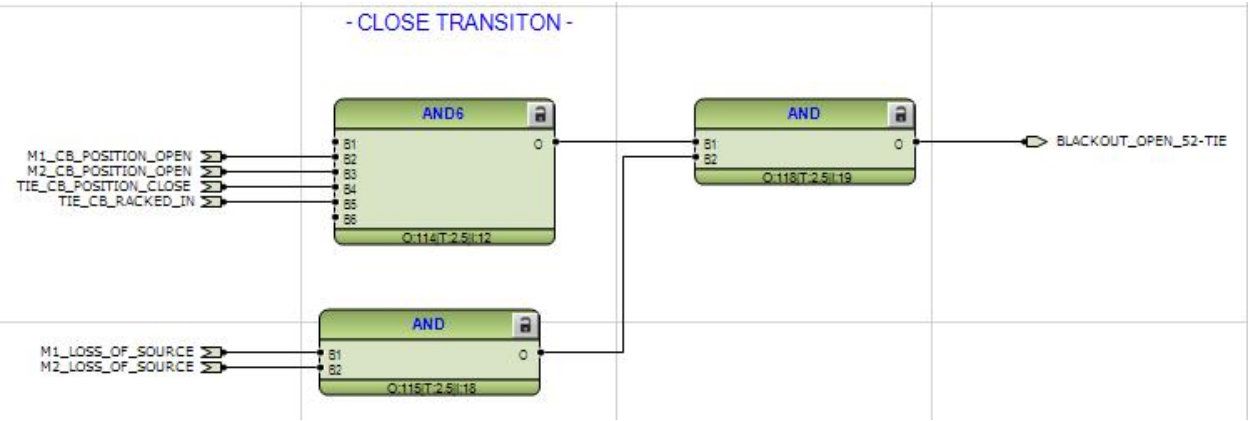
Tie

Close/Open Logic



Blackout



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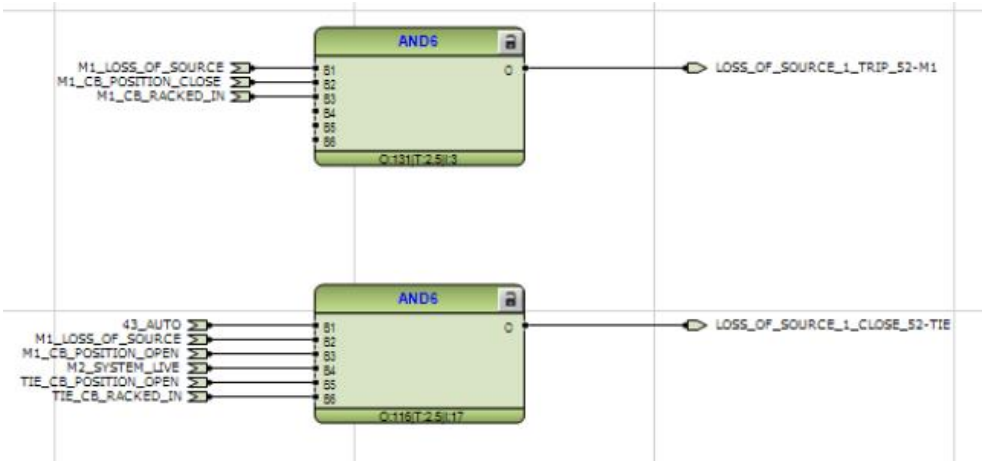
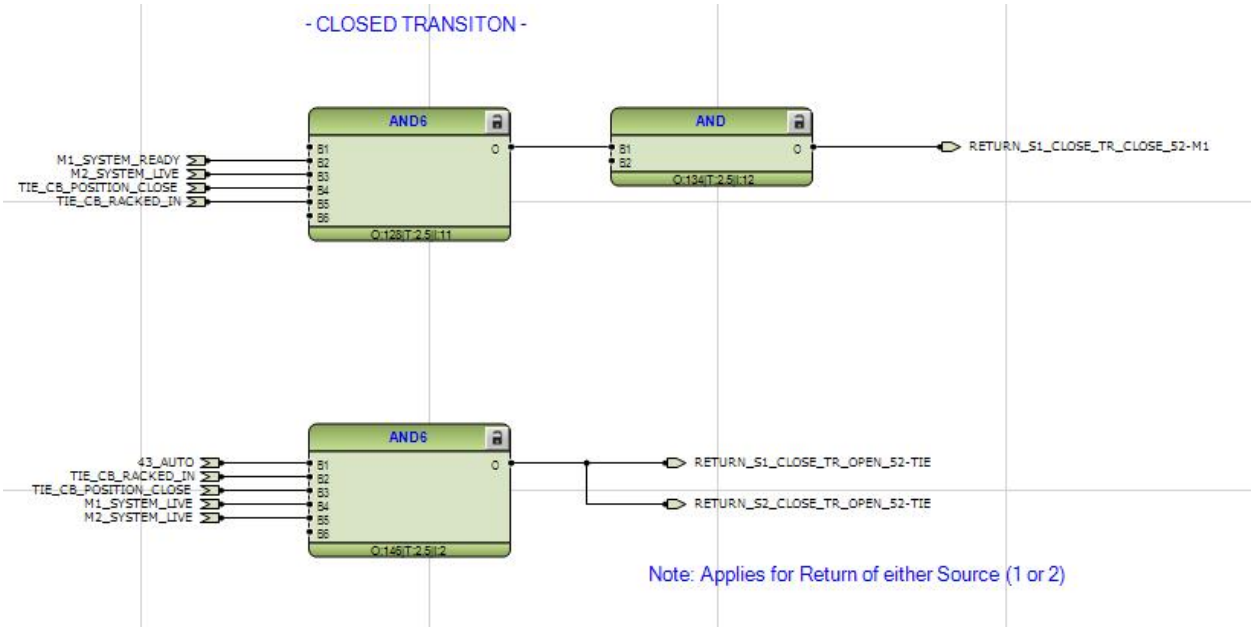
Loss of Source 1



Return of Source 1



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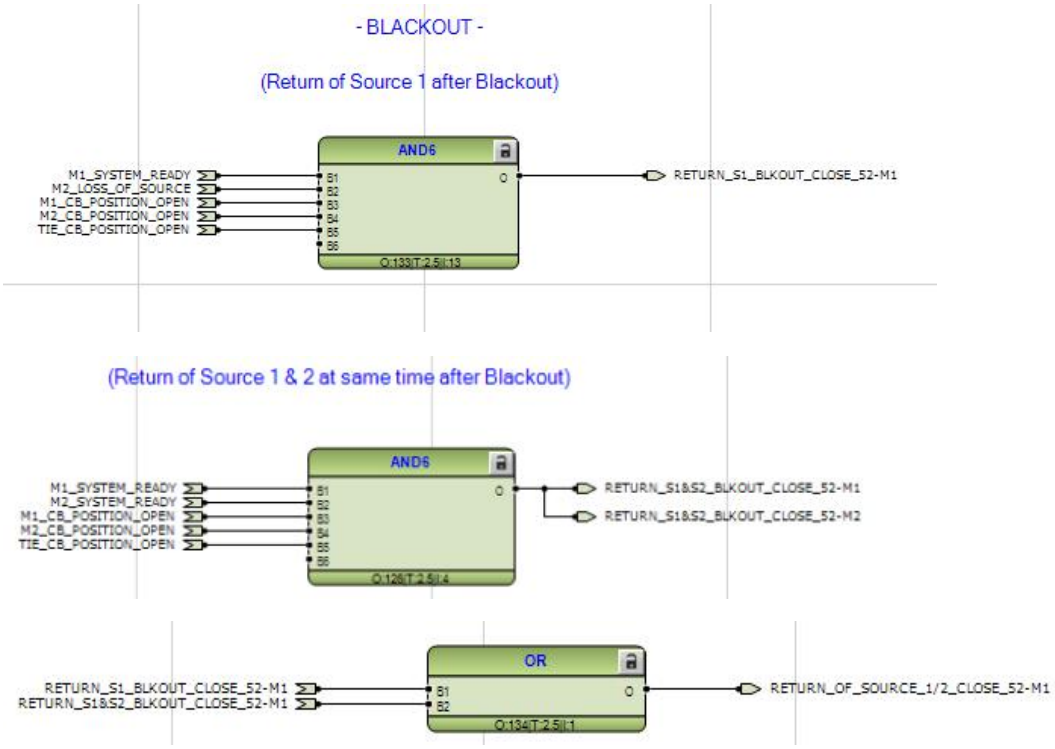
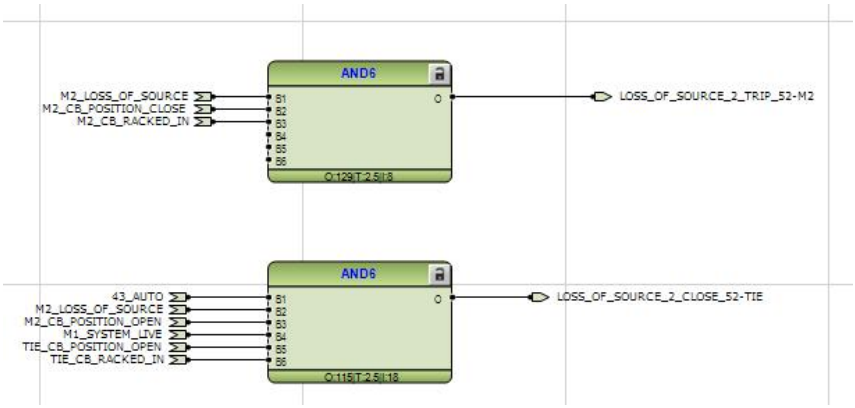


Loss of Source 2



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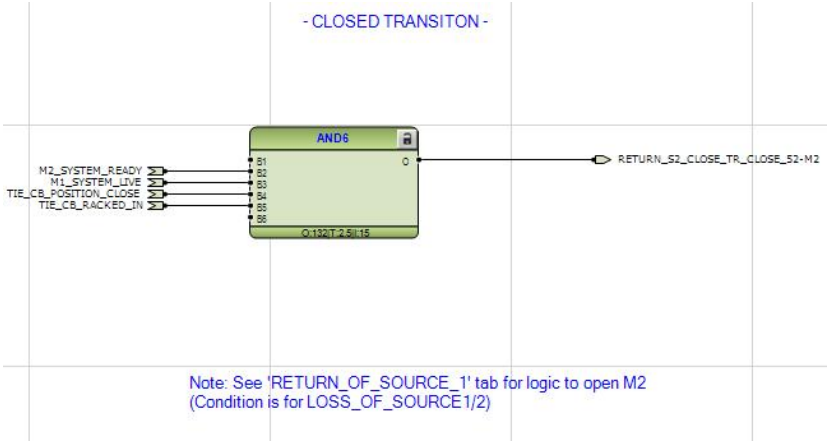
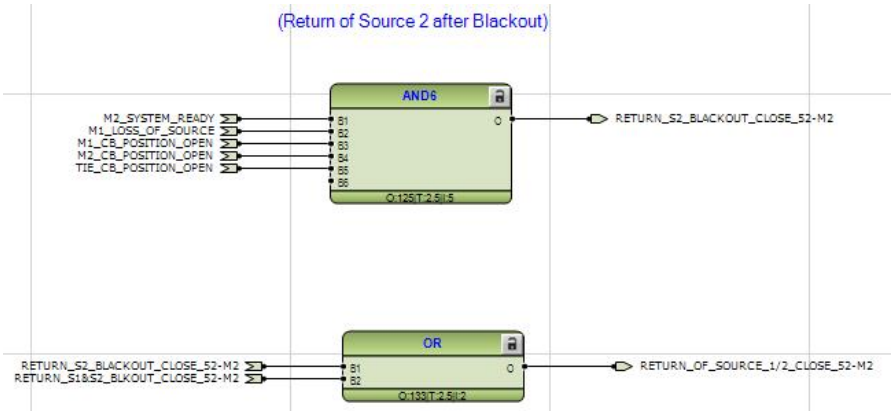
Return of Source 2





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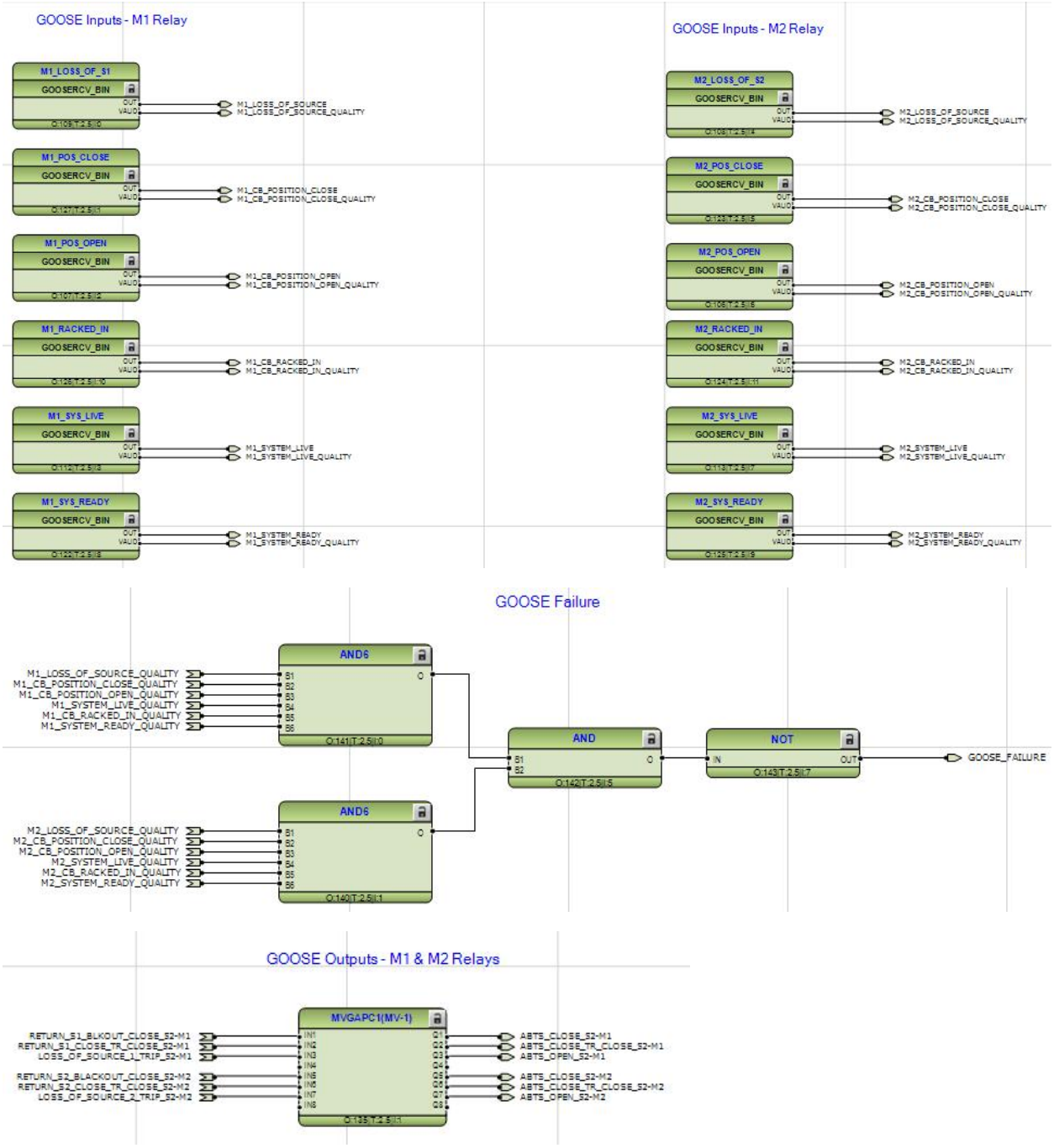
Goose Signals



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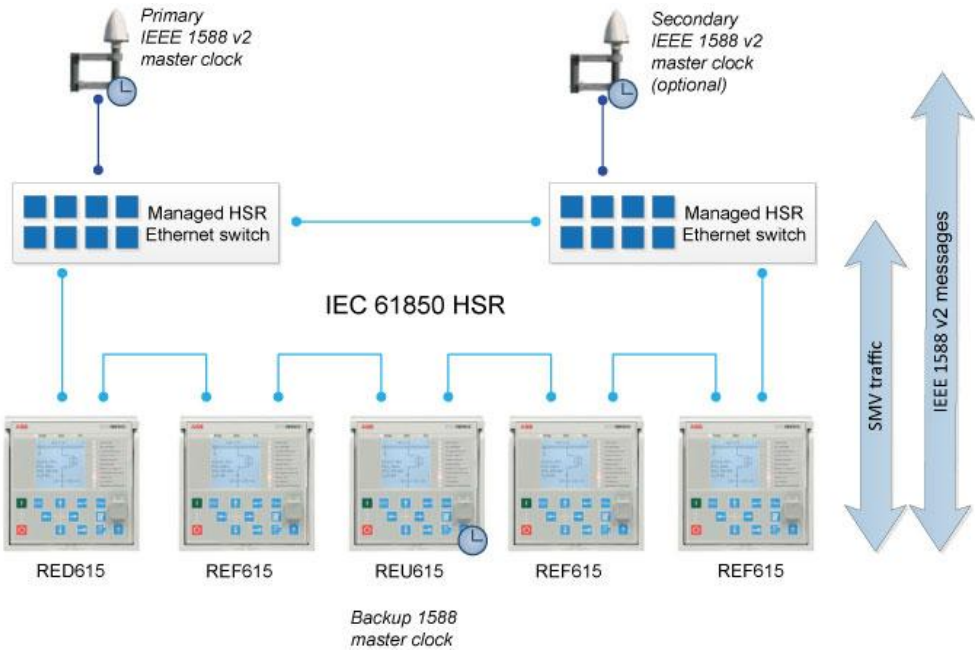
Ethernet Communications

The following schemes represents the preferred communications between relays to transmit GOOSE signals and to ensure that reliable communications exist for the implementation of the transfer scheme

HSR



PRP

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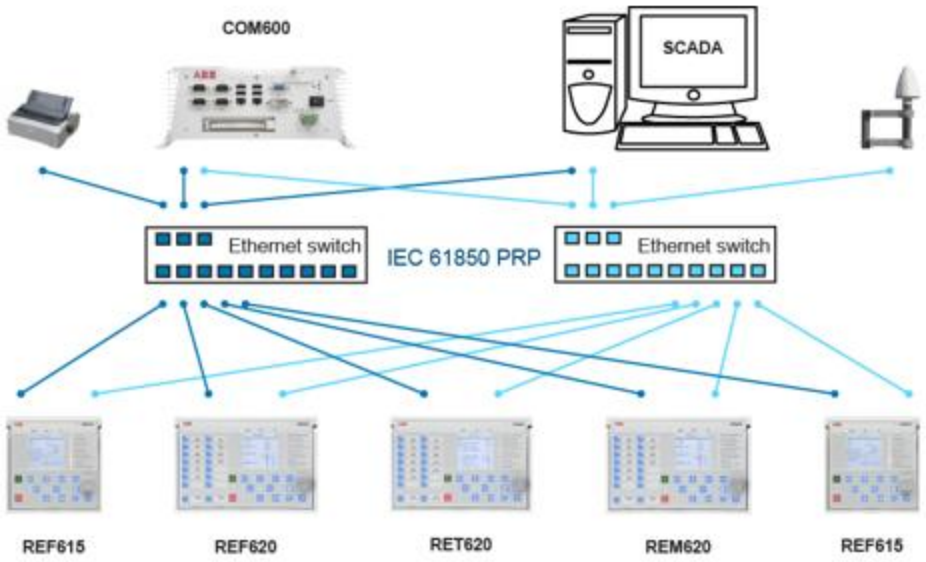

Bill of Material

43 M/A Manual/Auto switch

(3) Lockout Relays

(2) REF615 Ordering Code: HAFDDADAFHE5BBN12E for the Mains

(1) REF615 Ordering Code: HAFFFAFAFHE5BBN12E for the Tie

(1) Ethernet Switch

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