

Application Note

PCD Fault Test Mode Function Glenn Goldfarb- Application Engineering

Introduction

This function has been expanded considerably from previous versions. The following features have been added in V2.82:

- Test currents made settable
- Relay time added to fault test display -
- Operations records added on start / end of test _
- Multiple recloser shots allowed -
- Single phase / three phase tests allowed -
- Test is aborted if no pick up -
- Fault record enabled for all fault tests
- Test currents included in fault record -
- KSI sums not updated during fault test -
- Counters updated during fault test -

Test Setup

- Use a standard PCD with a recloser or simulator connected to the DIO-2 card. _
- Start up AFSuite and add the PCD online to the AFSuite database.
- Set the PCD to operate in three or single phase mode with four shots to lockout.

Set your Configuration, Primary Protection and Primary Recloser Settings:

Configuration

| et View 📮 🛄 | nit1 Online | | | | |
|-------------|------------------------------|---------------------------|-------------------|-------------------------------|---|
| Group1 | Jnit1 Configuration Unit1 On | line | | | |
| Group2 | | | | | _ |
| | ABB | | | Power Control Device | |
| | Unit1 · ONLINE | | | | |
| | Unit Meter | Records Basic Settings | Advanced Settings | Communication Utilities 🤇 🤇 🗭 | |
| | Configuration | Protection 🖡 Recloser 🖡 C | ounters Clock | | |
| | | | Send Data to | PCD | |
| | | | | | |
| | | Setting | Value | | |
| | | Unit Name | PCD2000 | | |
| | | VT Ratio | 1. 22000. ctor:1 | | |
| | | VT Connection | 120V Wye - | Fault Location Parameters + | |
| | | Frequency | 60 Hz - | | |
| | | Recloser Mode | 3-Phase Trin | Metering Parameters + | L |
| | | Curve Set | 1-Phase Trip | | L |
| | | Alternate 1 Setting | 3-Phase Trip | Advanced Parameters + | L |
| | | Alternate 2 Setting | Enable | | L |
| | | Zone Seg. Coordination | Enable - | | L |
| | | | | | |
| | | | Print to F | File | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | L |

ABB Inc.

August 23, 2004



Primary Protection

| | p <u>T</u> ools <u>Wi</u> r Oolioo | idow <u>H</u> eib | | | | | | | | | |
|--|--|--|--|--|--|--|---|---|--|--|---------|
| ABB Example Unit1 | Configuration | Unit1 Online | | | | | | | | | |
| Init1 | | | | | | | | | | | |
| | ABB | | | | | | | | Powe | r Control | Device |
| | Unit1 - UNLINE | ter Records Bs | acie Sottine | | Ivanced Settings | Communicatio | n I Itilitie | | | | |
| | Configuratio | on Protection F | Recloser (| Counte | rs Clock | Communicatio | | | | | ~~ 5 |
| | | P | | | (| | | | | | - |
| | | Primary | | | Send Data | to PCD | | [Pn | mary 💌 | | |
| | Elemen | t Curve | | Picku | ip Range | e Units | More | <u>79-1</u> 7 | <u>9-2</u> <u>79-3</u> | 79-4 79-5 | |
| | | | | | Phase Protect | tion | | | | | |
| | <u>51P</u> | Extremely Inverse | • | 600.00 | min:100 max: step:10 | :1600 Amps | + | 1PT 1 | PT 1PT | 3PL 3PL | |
| | <u>50P-1</u> | Standard | - | 1.2 | min:0.5 max step:0.1 | :20 Multiplier | + | 1PT 1 | PT DIS | DIS 3PL | |
| | 50P-2 | Disable 💌 | | 3.0 | min:0.5 max | :20 Multiplier | + | 3PL 3 | BPL 3PL | 3PL 3PL | |
| | 50P-3 | Disable 🔻 | | 10.0 | min:0.5 max | :20 Multiplier | + | 3PL 2 | PI 3PI | 3PI 3PI | |
| | | | | 1.0.0 | step:0.1 | tion | | | | | |
| | EAN | E. due no la la cara e | | 0.00 | min:10 max: | :160 | | 1DT 1 | DT 10T | 201 201 | |
| | <u>5 m</u> | Extremely inverse | | 100.00 | step:1 | 20.0 | | | | 51 - 51 - | |
| | <u>50N-1</u> | Standard | | 1.2 | step:0.1 | Multiplier | + | 1PT 1 | PT DIS | DIS 3PL | |
| | <u>50N-2</u> | Disable 🗾 | | 3.0 | step:0.1 | Mult./Amps | 3 + | 1PT 3 | BPL 3PL | 3PL 3PL | |
| | <u>50N-3</u> | Disable 💌 | | 3.0 | min:0.5 max step:0.1 | Multiplier | + | 3PL 3 | BPL 3PL | 3PL 3PL | |
| | 18 | | | | | | | | | | |
| | | | | | Advanced Prote | ection | | | | | |
| mary Reu uite Edit Options Setur w 4 Unit1 | Closer | ndow <u>H</u> elp | | - | Advanced Prote | ection | - | | | | 1 🔳 |
| mary Re uite Edit Options Setur ew R Uniti ABE Example Group1 Group2 | Closer p Iools Wr Online Configuration | ndow <u>Help</u> Unit i Online | | | Advanced Prote | ection | | | Power | r Control | Device |
| mary Re uite Edit Options Setur Setur Saroup1 Saroup1 Saroup2 | Closer o Iools Wir Online Configuration ABB Uniti - ONLINE Uniti - Mer | ndow <u>Heip</u> Unit1 Online | asic Setting | r Ja Ad | Advanced Prote | tenn | on Utilitie | 98 | Power | r Control | Device |
| mary Re uite Edit Options Setur ave a Initi Sroup1 Sroup2 | Closer Dots Wr Orine Configuration ADD Unit Me Configuration | ndow <u>H</u> elp Unit I Online ter <u>Records</u> Ba | asic Setting Recloser | js Ad | Advanced Prote | teon | on Utilitie | 25 | Powe | r Control | Device |
| mary Rev uite Edit Options Setur ave a Uniti aroup1 aroup2 | Closer Dols Wy Orine Configuration | uniti Online Uniti Online ter Records Ba nn Protection F | asic Setting Recloser (Single Ph | js Ad Counte nase Trip I | Advanced Prote | All Phases | on Utilitie | 25 | Powe | r Control | Device |
| mary Reu uite Edit Options Setur www.w.Uniti ABE Example Group1 Sroup2 | Closer Dols Wr Orine Configuration Unit OnLine Configuration | uniti Online | asic Setting Recloser (Single Ph | js Ad Counte nase Trip I | Advanced Prote | All Phases | n (Utilitie | 25 | Power | r Control | Device |
| mary Re uite Edit Options Setur w 4 Uniti ABB Example sroup1 Sroup2 | Configuration | ndow <u>Help</u> Unit 1 Online ter Records Ba on Protection F | asic Setting Recloser (Single Ph | js Ad Counte nase Trip I | Advanced Prote | All Phases 2 Mode Select 79-3 | on Utilitie | 35 | Power | r Control | Device |
| mary Re ute Edit Options Setur W 4 Uniti ABB Example Sroup1 Sroup2 | Configuration | undow Help Unit1 Online ter Records Ba on Protection F Protections 51P | asic Setting Recloser (Single Ph 79-1 Enable 11 | ps Ad Counte mase Trip I | Advanced Prote | All Phases Mode Select 79-3 Frable 1P | on Utilitie 79-4 Lockout 3F | | Power 79-5 .ockout 3F | r Control | Device |
| mary Reu ute Edit Options Setur ave 1 Unit1 ave Example aroup1 aroup2 | Colosser Configuration Configuration Unit - ONLINE Unit - Online Configuratio | undow Help Unit1 Online ter Records Ba on Protection F Protections 51P 50P-1 | asic Setting Recloser (Single Ph 79-1 [Enable 1] [Enable 1] [Enable 1] | js Ad Counte P Y P Y | Advanced Prote | Communication | n Utilitie 79-4 Lockout 3F Disable | 28 28 28 28 28 28 28 28 28 28 28 28 28 2 | Power 79-5 .ockout 3F .ockout 3F | r Control | Device |
| mary Re uite Edit Options Setur ABE Example sroup1 Si Uniti Si Uniti | Colosser Configuration Configuration Unit - ONLINE Unit - Mere Configuration | unkt Online Unkt Online Unkt Online Protection Protection F Protection F SOP-1 SOP-2 SOP-3 | asic Setting Recloser (Single Ph Pable 11 Enable 11 Lockout 3 Lockout 3 | js Ad Counte asse Trip I P ≥ ∫ P ≥ ∫ | Advanced Prote | International In | n Utilitie 79-4 Lockout 3F Disable Lockout 3F | | Power 79-5 .ockout 3F .ockout 3F .ockout 3F | • Control | Device: |
| mary Re uite Edit Options Setur ave a Initi ave Example aroup1 if Uniti if Unit | Closer Dols W/ Orino Configuration | Indow Help Unit Online Unit Online ter Records Ba on Protection R OProtections 51P 50P-1 50P-2 50P-3 51N | asic Setting Recloser (Single Ph 79-1 Enable 11 Enable 11 Lockout 3 Lockout 3 Enable 11 | js Ad Counte ase Trip P y ∏ P y ∏ P y ∏ P y ∏ P y ∏ | Advanced Prote min-100 max wanced Settings rs Clock Mode One Or P9-2 Enable 1P ¥ Lockout 3P ¥ Enable 1P ¥ | All Phases Mode Select 79-3 Enable 1P × Lockout 3P × Enable 1P × | 79-4 Lockout 3F Disable Lockout 3F Lockout 3F | | 79-5 .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F | Control Con | Device |
| mary Reu uite Edit Options Setur are Example aroup1 Sroup2 | Closer Dols Wr Orline Configuration Unit Orline Configuration | Indow Eleip Unit Online Unit Online Unit Online Protection File Solp-1 Solp-2 Solp-3 Soln-1 | asic Setting Recloser (Single Ph Enable 11 Enable 11 Lockout 3 Enable 11 Enable 11 Enable 11 | s Ad Counte P Y [P Y] P Y] P Y] P Y] P Y] | Advanced Prote min-100 max min-100 max vanced Settings rs Clock Mode One Or P-2 Enable 1P Lockout 3P Lockout 3P Enable 1P Enable 1P E | All Phases Toronov Mode Select 79.3 Enable 1P × Disable × Lockout 3P × Lockout 3P × Enable 1P × Disable × | n Utilitie 79-4 Lockout 3F Disable Lockout 3F Lockout 3F Lockout 3F | | Power 79-5 .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F | | Device |
| mary Re uite Edit Options Setur ave 4 Uniti aroup1 aroup2 | Configuration | Indow Etelp Unit 1 Online ter Records Ba in Protection F 51P 50P-1 50P-2 50P-3 51N 50N-1 50N-1 50N-1 50N-2 | asic Setting Recloser Single Ph Phable 11 Enable 11 Lockout 3 Enable 11 Enable 11 Enable 11 | ys Ad Countes Ad P I P I P I P I P I P I | Advanced Prote min-100 max min-100 max wanced Settings rs Clock Mode One Or P-2 Enable 1P × Lockout 3P × Lockout 3P × Enable 1P × Enable 1P × Lockout 3P × Enable 1P × Enable 1P × | All Phases Toronov Mode Select 79-3 Enable 1P × Disable × Lockout 3P × Enable 1P × Lockout 3P × Enable 1P × Lockout 3P × Enable 1P × | n Utilitie 79.4 Lockout 3F Disable Lockout 3F Lockout 3F Disable Lockout 3F | | 79-5 ockout 3F ockout 3F ockout 3F ockout 3F ockout 3F ockout 3F ockout 3F | | Device |
| mary Re ute Edit Options Setur Soup1 Sup1 | Configuration | Indow Etelp Unit 1 Online Unit 1 Online Unit 1 Online Protections 51P 50P-1 50P-2 50P-3 51N 50N-1 50N-2 50N-3 50N-1 | ssic Setting Recloser (Single Ph Pable 11 Enable 11 Lockout 3 Enable 11 Enable 11 Enable 11 Enable 11 Enable 11 Lockout 3 | gs Add Counte asse Trip I P | Advanced Prote min-100 max min-100 max vanced Settings rs Clock Mode One Or P-2 Enable 1P × Enable 1P | All Phases Mode Select 79-3 Enable 1P × Disable × Lockout 3P × Lockout 3P × Lockout 3P × Lockout 3P × Lockout 3P × | n Utilitie J Lockout 3F Lockout 3F Lockout 3F Lockout 3F Lockout 3F Disable Lockout 3F Lockout 3F Lockout 3F | | 79-5 .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F | | Device |
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| mary Reu ute Edit Options Setur ave 1 Uniti Tavpa1 Uniti Soup2 | Colosser Configuration | undow Help Unit I Online Unit I Online Unit I Online Protections 51P 50P-1 50P-2 50P-3 50P-3 50N-1 50N-2 50N-3 51N 50N-2 50N-3 46 67P 67N | sic Setting Recloser (Single Ph Pable 11 Enable 11 Enab | ys Ad Counte ase Trip I P → [P → []]]]]]]]]]]]]]]]]]] | Advanced Prote min-100 max min-100 max Advanced Settings rs Clock Content Conte | Communicatio Comm | n Utilitie 79-4 Lockout 3F Disable Lockout 3F Lockout 3F Lockout 3F Lockout 3F Lockout 3F Lockout 3F Lockout 3F Lockout 3F | | Power 79-5 .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F | | Device |
| mary Re ute Edit Options Setur ave util Soup1 Soup2 | Configuration | Indow Etelp Unit 1 Online Unit 1 Online Unit 1 Online Ter Records Ba In Protection F S1P 50P-1 50P-2 50P-3 51N 50N-1 50N-2 50N-3 46 67P 67P 0Pen Interval Time (s) 0.1 - 200, sep: 0.1 | sic Setting Recloser Single Ph Enable 11 Enable 11 Lockout 3 Enable 11 Enable 11 Enable 11 Lockout 3 Lockout 3 Lockout 3 Lockout 3 Lockout 3 Lockout 3 | ya Add Counter Add P I P I P I P I P I P I P I P I P I P I P I P I P I P I P I P I I I I I | Advanced Prote min-101 max min-101 max wanced Settings rs Clock T9-2 Enable 1P Enable 1P Lockout 3P Enable 1P Lockout 3P Lockout 3P | | n Utilitie 79.4 Lockout 3F Disable Lockout 3F Lockout 3F Lockout 3F Lockout 3F Lockout 3F Lockout 3F Lockout 3F Lockout 3F | | 79-5 .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F .ockout 3F | | Device |



Test

Make sure the Breaker is closed. The general test sequence is settable only from the front panel:

From the Current Metering Mode: 1) Press the ENTER KEY to access the MAIN MENU

- 2) Scroll down to Test
- 3) Press ENTER KEY to View TEST MENU
- 4) From the TEST MENU Scroll down to Fault Test Mode
- 5) Press ENTER KEY
- 6) Press ENTER KEY to Enter Password (Password Default is 4 blanks- PRESS ENTER KEY)
- 7) Press "C" to continue test

NOTE: The PCD Display will show Psim=02.0 :: Nsim=02.0 This is the Current in Multiple of Pickup setting for Phase and Neutral. IF the Primary 51P pickup current is set to 600A, then the Psim=2 will simulate 1200A applied. Psim / Nsim can be set from .5 to 10 by using the up and down arrow keys)

8) Press ENTER KEY to start the Fault Test Mode test

The Recloser or Simulator should perform 3 reclose cycles per the example Recloser Settings and then Lockout. The data per Table 1 and Table 2 below can be logged for reference.

9) In AFSuite online, select Records, Operation Summary, Operations Record and Fault Summary as shown below. Record the results in Table 1.

10) Press the Clear key "C" when completed.

| 655 Century Point | Telephone 1-800-929-7947 | Fax | www.abb.com/mediumvoltage | Application Note 1VAL264203-AP |
|---------------------|-----------------------------|--------------|---------------------------|-----------------------------------|
| Lake Mary, FL 32746 | +1-407-732-2000 | 407-732-2029 | | Rev. A |

August 23, 2004



Operations Summary

| Ele Edit Options Setup Tools Window Help Elect View a Unit Opline | | | | | ~ |
|--|--|------------------------|---|--|------------------------------------|
| ABB Example Unit1 Configuration Unit1 Online | | | | | |
| Group1 | | | | | |
| R-m Group2 | | | | Power Control Device | |
| Unit1 - ONLINE | | | | | |
| Unit Meter Reco | rds Basic Settings | Advanced Settings | Communication Utilities | | |
| Uperations Summary | Uperations Records | -aults Summary 🌔 | | | |
| | Setting | Value | Setting | Value | |
| Break | er Ops. Counter (3 ph mode) | 1 | KSI Sum A Counter | 0 | |
| | Reclose Counter 1 | 15 | KSI Sum B Counter | 0 | |
| | Reclose Counter 2 | 15 | KSI Sum C Counter | 0 | |
| | 1st Reclose Counter | 0 | Overcurrent Trip | <u>+</u> | |
| | 2nd Reclose Counter | 0 | Phase A Counters (1 ph mode) | + | |
| | 3rd Reclose Counter | 3 | Phase B Counters (1 ph mode) | <u>•</u> | |
| | 4th Reclose Counter | 0 | Phase C Counters (1 ph mode) | <u>·</u> | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | - |
| AFSuite ver 1.0 - Micros | oft Internet Ex | | (| | |
| Pristice ver. 1.0 - Prieros | ore incernee ex | | 2 | | |
| | | | | | |
| Phase A C | Counters | | | | |
| | | | 2 | 10.10 0.1 | |
| Setting | | Value | AFSuite ver | . 1.0 - Microsoft J | .n 💶 💷 |
| | | | | | |
| Phase A Pole Operation | Counter | 21 | Overc | urrent Trip Coun | ters |
| Phase A Recloser Count | er 1 | 15 | Sotting | | |
| | | 10 | Security | | Valuo |
| | | | | | Value |
| Phase A Recloser Count | er 2 | 15 | Overcurrent | Trin Counter | Value 21 |
| Phase A Recloser Count | er 2 Counter | 15 | Overcurrent | Trip Counter | Value 21 |
| Phase A Recloser Count Phase A Stage 1 Reclose | er 2 e Counter | 15 0 | Overcurrent Overcurrent | Trip Counter Trip A Counter | Value 21 21 |
| Phase A Recloser Count Phase A Stage 1 Reclose Phase A Stage 2 Reclose | er 2 e Counter e Counter | 15 0 0 | Overcurrent Overcurrent | Trip Counter Trip A Counter | Value 21 21 |
| Phase A Recloser Count Phase A Stage 1 Reclose Phase A Stage 2 Reclose | er 2 e Counter e Counter | 15 0 0 | Overcurrent Overcurrent Overcurrent | Trip Counter Trip A Counter Trip B Counter | Value 21 21 0 |
| Phase A Recloser Count Phase A Stage 1 Reclose Phase A Stage 2 Reclose Phase A Stage 3 Reclose | er 2 e Counter e Counter e Counter | 15 0 0 3 | Overcurrent Overcurrent Overcurrent Overcurrent | Trip Counter Trip A Counter Trip B Counter Trip C Counter | Value 21 21 0 0 |
| Phase A Recloser Count Phase A Stage 1 Reclose Phase A Stage 2 Reclose Phase A Stage 3 Reclose Phase A Stage 4 Reclose | er 2 e Counter e Counter e Counter e Counter | 15 0 0 3 0 | Overcurrent Overcurrent Overcurrent Overcurrent | Trip Counter Trip A Counter Trip B Counter Trip C Counter | Value 21 21 0 0 |
| Phase A Recloser Count Phase A Stage 1 Reclose Phase A Stage 2 Reclose Phase A Stage 3 Reclose Phase A Stage 4 Reclose | er 2 e Counter e Counter e Counter e Counter | 15 0 0 3 0 | Overcurrent Overcurrent Overcurrent Overcurrent Overcurrent | Trip Counter Trip A Counter Trip B Counter Trip C Counter Trip N Counter | Value 21 21 0 0 21 |
| Phase A Recloser Count Phase A Stage 1 Reclose Phase A Stage 2 Reclose Phase A Stage 3 Reclose Phase A Stage 4 Reclose | er 2 e Counter e Counter e Counter e Counter | 15 0 3 0 | Overcurrent Overcurrent Overcurrent Overcurrent Overcurrent | Trip Counter Trip A Counter Trip B Counter Trip C Counter Trip N Counter | Value 21 21 0 0 21 |
| Phase A Recloser Count Phase A Stage 1 Reclose Phase A Stage 2 Reclose Phase A Stage 3 Reclose Phase A Stage 4 Reclose | er 2 e Counter e Counter e Counter e Counter | 15 0 3 0 | Overcurrent Overcurrent Overcurrent Overcurrent Overcurrent | Trip Counter Trip A Counter Trip B Counter Trip C Counter Trip N Counter | Value 21 21 0 21 21 |
| Phase A Recloser Count Phase A Stage 1 Reclose Phase A Stage 2 Reclose Phase A Stage 3 Reclose Phase A Stage 4 Reclose | er 2 e Counter e Counter e Counter e Counter | 15 0 3 0 | Overcurrent Overcurrent Overcurrent Overcurrent Overcurrent | Trip Counter Trip A Counter Trip B Counter Trip C Counter Trip N Counter | Value 21 21 0 21 21 |

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Operations Records

| Group1 | hit1 Configuration Unit1 | l Online | | | | | |
|--------|--------------------------|--------------|---------------------|------------------|-------------------------|------------|------------|
| Group2 | ABB | | | | | Power Cont | rol Device |
| | Unit1 - ONLINE | | | | | | 4 + |
| | Unit Meter | Records | Basic Settings (Ac | Ivanced Settings | Communication Utilities | | |
| | Operations Sun | nmary 🖣 Oper | ations Records 🖡 Fa | ults Summary | | | |
| | | Oper. Num. | Date | Time | Message | Value | |
| | | 384 | 18 Aug 2004 | 11:16:46.920 | Fault Test End | 0 | |
| | | 383 | 18 Aug 2004 | 11:16:44.850 | Recloser Lockout | 3 | |
| | | 382 | 18 Aug 2004 | 11:16:44.850 | Recloser Lockout | 2 | |
| | | 381 | 18 Aug 2004 | 11:16:44.850 | Recloser Lockout | 1 | |
| | | 380 | 18 Aug 2004 | 11:16:44.850 | 52b Closed | 3 | |
| | | 379 | 18 Aug 2004 | 11:16:44.850 | 52b Closed | 2 | |
| | | 378 | 18 Aug 2004 | 11:16:44.850 | 52b Closed | 1 | |
| | | 377 | 18 Aug 2004 | 11:16:44.850 | 52a Opened | 3 | |
| | | 376 | 18 Aug 2004 | 11:16:44.850 | 52a Opened | 2 | |
| | | 375 | 18 Aug 2004 | 11:16:44.850 | 52a Opened | 1 | |
| | | 374 | 18 Aug 2004 | 11:16:44.850 | Breaker Opened | 3 | |
| | | 373 | 18 Aug 2004 | 11:16:44.850 | Breaker Opened | 2 | |
| | | | | | | | |
| | | | | | | | |

Fault Summary

| ABB Example Group1 | Unit1 | Configur | ation l | Jnit1 Onlin | 3 | | | | | | | | |
|-----------------------|-------|------------|----------|--------------------|-----------------|---------|----------------|--------------|-----------|-------|-------|------------|------|
| g Groupz | | ABB | | | | | | | | | Power | Control De | vice |
| | | Init1 - ON | | | | | A.L. L.D. W. | 100 | 1 Ciner | - | | | |
| | | Opera | ations : | er (Re Summary | Operations Re | cords (| Faults Summary | | in (Otili | ies (| | < | |
| | | | | Fault Num. | Recl. Seq. | Elem. | Date | Time | IA(A) | IB(A) | IC(A) | IN(A) | |
| | | | + | 21 | Primary-Lockout | 51P | 18 Aug 2004 | 11:16:44.850 | 1200 | 0 | 0 | 120 | |
| | | | + | 20 | Primary-3 | 51P | 18 Aug 2004 | 11:16:19.180 | 1200 | 0 | 0 | 120 | |
| | | | + | 19 | Primary-2 | 50P-1 | 18 Aug 2004 | 11:15:58.510 | 1200 | 0 | 0 | 120 | |
| | | | + | 18 | Primary-1 | 50P-1 | 18 Aug 2004 | 11:15:58.200 | 1200 | 0 | 0 | 120 | |
| | | | + | 17 | Primary-Lockout | 51P | 18 Aug 2004 | 11:05:48.590 | 1260 | 0 | 0 | 120 | |
| | | | | | | | | | | Q | 30 |) | |



| And AFSuite | | | | | | | | le x |
|-------------------------|--|--------------------------|---------------------------------|--|------------------------|----------|----------------|--------|
| Eile Edit Fleet View | Options Setup Tools Windov Unit1 Online | v <u>H</u> elp | | | | | | × |
| ABB Exa | Unit1 Configuration Unit | 1 Online | | | | | | |
| ⊞ ∰ Group2 | | | | | | | | - |
| | ABB | | | | | Power | Control Device | e la |
| | Unit1 - UNLINE | Decorde Bacic | Sattings Advanced S | ottinge Commu | vication Utilition | | A = | |
| | Operations Sur | mmary Operations | Records Faults Sumr | nary | incation (Otimites | | | |
| | | | | | | | | |
| | | Description | Value | Description | Ampl. | Angle | | |
| | | Record Number | 21 | IA (A) | 1200 | 0 | | |
| | | Recl. Seq. | Primary-Lockout | IB (A) | 0 | 0 | | |
| | | Date | 18 Aug 2004 | IC (A) | 100 | 0 | | |
| | | Time | 11:16:44.850 | IN (A) | 120 | 0 | | |
| | | Distance (miles) | 51P | I2 (A) | 0 | 0 | | |
| | | Impedence (Ohm) | 0.000 | 10 (A) | 0 | 0 | | |
| | | Relay Time (ms) | 15604 | | | | | |
| | | Clear Time (ms) | 45 | Van (kV) | 0.00 | 0 | | |
| | | | | Vbn (kV) | 0.00 | 45 | | |
| | | | | Vcn (kV) | 0.00 | 45 | | |
| | | | | V1 (KV) | 0.00 | 0 | | |
| | | | | V2 (KV) | 0.00 | 0 | | |
| | | | | | | | | |
| | | | | | | Back | | |
| | | | | | | | | |
| T 11 | 1 | | | | | | | |
| Table | 1 | | | | | 1 | | |
| | | Record | | | 3ø | 1φ | | |
| | | | | | 4 shot | 4 shot | | |
| Record | ls / Ops_Summ | arv / Break | er Ons | | | | | |
| Pagar | de / Ope. Summ | ary / KSI S | $\frac{100}{100}$ | r | | | | |
| D | <u>18 / Ops. Summ</u> | $\frac{ary}{KSTS}$ | | 1 | | | | |
| Record | is / Ops. Summ | ary / OC tri | p Counter | | | _ | | |
| Record | is / Ops. Record | 1 / Last ope | ration # | | | | | |
| Record | ls / Fault Summ | nary / Last f | ault record # | | | | | |
| | | . (| Department / te | est | | | 36 | 1ሐ |
| | | - | P | | | | 4 shot | 4shot |
| 1 | Tet the test me | 1 . | (1 | | (21 | 11) | 4 51101 | -51101 |
| 1 | Let the test ru | n to comple | uon until the | unit lock | s out (30 | or 19). | | |
| | The fault disp. | lay should s | show the Rel | ay time. | | | | |
| 2 | Update the rec | cords in AF | Suite. | | | | | |
| 3 | The operation | s records sh | ould show se | everal new | operatio | ns: | | |
| - | Fault test start | hreaker tr | in breaker of | ontacte lo | ckout and | Fault | | |
| | tost and | , oreaser th | ip, oreaker et | Jinacio, 10 | exout and | . i ault | | |
| 4 | | | | 1 | 0 ~ | | | |
| 4 | The operation | s summary | should show | the Break | ter Ops C | ounter | | |
| | and Overcurre | ent trip cour | nters updated | , and the H | KSI Sum | A | | |
| | Counter uncha | anged | - | | | | | |
| 5 | The Faults Su | mmory show | uld above the | 1. 0. | 1 T | ha tast | | |
| 5 | | | Ing Show the | result of t | ne rest | | | • |
| | current should | hinary sho | as the foult of | result of t | the curre | nt iesi | | |
| | current should | be logged | as the fault c | result of t urrent, all | the curre | nt | | |
| | current should angles should | be logged be zero, an | as the fault c d the Relay T | result of t urrent, all fime and (| the curre clear Tim | nt nt | | |