

Substation Automation and Protection Division

## ORION Quick Start Guide For The Conitel C300 Or C2020 To ABB Protective Relays Using Modbus

*This Quick Start Guide shall enable the user to attach a single ABB 2000R series protective relay to the ORION unit communicating over a 485 physical cable connection.*

*Required equipment:*

- A. ORION UNIT
- B. ONE ABB PROTECTIVE RELAY (TPU/GPU/DPU 2000R)
- C. IBM Compatible PC with DOS 5.0 (or greater), Windows 3.1, 95, or 98 installed.
- D. ONE CABLE ASSEMBLY KIT WHICH CONTAINS:
  - a. One RS 232 Cable.
  - b. One RS 485 Cable.
  - c. One Troubleshooting Diskette.

1. Apply power to the universal power supply according to the markings on the unit as shown in Figure 1 illustration 1. The unit accepts voltages from 55 to 200 V a.c. or 20 to 280 V d.c.

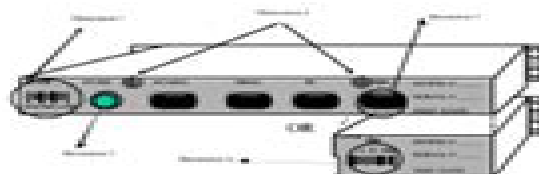
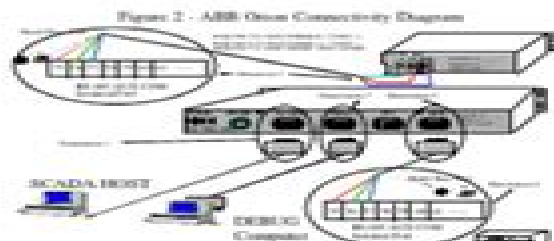


FIGURE 1 ORION Connector Location

2. Connect the SCADA host to the ORION SCADA MASTER RS 232 port with a 9 pin D shell connector. The cable end should mate with the ORION's male connector. The unit is a DTE pinout and a custom cable may have to be developed for your application since SCADA Host RS 232 connections, handshaking requirements vary per each manufacturer. The ORION SCADA MASTER RS 232 port connection is shown in Figure 2 illustration 1.



# Abb Protective Relay Application Guide

**ML Yell**

A decorative graphic element consisting of a light blue horizontal bar with a rounded right end, and a red semi-circular shape behind it.

## **Abb Protective Relay Application Guide:**

**Protective Relaying** Walter A. Elmore, 2003-09-09 Targeting the latest microprocessor technologies for more sophisticated applications in the field of power system short circuit detection this revised and updated source imparts fundamental concepts and breakthrough science for the isolation of faulty equipment and minimization of damage in power system apparatus The Second Edition clearly describes key procedures devices and elements crucial to the protection and control of power system function and stability It includes chapters and expertise from the most knowledgeable experts in the field of protective relaying and describes microprocessor techniques and troubleshooting strategies in clear and straightforward language     [The Relay Testing Handbook #7: End-to-End Testing](#) Chris Werstiuk, 2013 This package provides an overview of End to End testing and answers the most common questions a relay tester should ask before performing their first End to End test A basic introduction of this test technique is followed by a step by step procedure for performing a successful end to end test This package also includes an overview of the most common communication assisted protection schemes to help the reader understand how these schemes operate Go to <http://relaytraining.com/product/end-to-end-testing-print> for more information This paper will NOT be part of the final Relay Testing Handbook     [The Relay Testing Handbook #1D](#) Chris Werstiuk, 2007 As the first of The Relay Testing Handbook series Electrical Fundamentals for Relay Testing contains the underlying electrical theory that all relay testers should understand This information provides a foundation that all other handbooks in the series use when describing the most common protective elements how they function and the most effective and efficient procedures used to test them Even experienced relay testers can benefit from having this manual on hand as a quick reference when facing an unfamiliar relay testing situation Use the practical examples outlined in this volume to help you Understand the three phase electrical system Create and understand phasor diagrams Apply Delta and Wye connections Understand the power triangle Understand basic transformer theory Understand current and potential transformers and connections Recognize the most common fault types and when to apply them Recognize the most common system grounding techniques Calculate positive negative and zero sequence components Understand why and how protective relays are applied Paperback 102 pages Trim Size 8 5x11 Publisher Valence Electrical Training Services LLC Language English ISBN 13 978 1 934348 04 8 LCCN 2012934170     [Power System Stability and Control](#) Leonard L. Grigsby, 2007-05-30 Part of the second edition of The Electric Power Engineering Handbook Power System Stability and Control offers conveniently focused and detailed information covering all aspects concerning power system protection dynamics stability operation and control Contributed by worldwide leaders under the guidance of one of the world's most respected     [The Relay Testing Handbook #9D](#): Chris Werstiuk, 2012-02-28 The Relay Testing Handbook was created for relay technicians from all backgrounds and provides the knowledge necessary to test most modern protective relays installed over a wide variety of industries Basic electrical fundamentals detailed descriptions of protective elements and generic test

plans are combined with examples from real life applications to increase your confidence in any relay testing situation A wide variety of relay manufacturers and models are used in the examples to help you realize that once you conquer the sometimes confusing and frustrating man machine interfaces created by the different manufacturers all digital relays use the same basic fundamentals and most relays can be tested by applying these fundamentals This package provides a step by step procedure for testing the most common distance protection applications used by a variety of manufacturers Each chapter follows a logical progression to help understand why distance protection is used and how it is applied Testing procedures are described in detail to ensure that the distance protection has been correctly applied Each chapter uses the following outline to best describe the element and the test procedures ApplicationSettings Pickup Testing Timing Tests Tips and Tricks to Overcome Common Obstacles Real world examples are used to describe each test with detailed instructions to determine what test parameters to use and how to determine if the results are acceptable Thank you for your support with this project and I hope you find this and future additions of The Relay Testing Handbook to be useful     [The Relay Testing Handbook](#)

**#2D** Chris Werstiuk, 2007-06 As modern protective relays become increasingly more powerful and complex many relay testers continue to use test procedures and philosophies that are based on previous generations of relays and their limitations Modern relays have very different characteristics that require a different testing philosophy to ensure that they will operate when required As the second of The Relay Testing Handbook series Relay Testing Fundamentals builds on the electrical theory principles introduced in the first package Electrical Fundamentals for Relay Testing In this in depth discussion of protective relays you will learn about the history of protective relaying including Electromechanical relays Solid state relays Simple microprocessor relays Multifunction microprocessor relays Relay testers of all skill levels can benefit from a solid foundation of relay testing fundamentals the foundational elements included in this book include Reasons for relay testing Essential relay testing equipment The importance of using different test techniques for various relay generations Traditional test procedures for element testing Logic and dynamic testing Combining test techniques for more efficient and effective relay testing Applying test techniques that take advantage of modern test equipment and software This book is included in the hardcover book The Relay Testing Handbook Principles and Practice or it can be ordered by itself as a soft cover book Adobe Acrobat PDF digital download or both Paperback 86 pages Trim Size 8 5x11 Publisher Valence Electrical Training Services LLC Language English ISBN 13 978 1 934348 05 5 LCCN 2012934618     **The Relay Testing Handbook**

**#4D** Chris Werstiuk, 2007-10 As modern protective relays become increasingly more powerful and complex many relay testers continue to use test procedures and philosophies that are based on previous generations of relays and their limitations Modern relays have very different characteristics that require a different testing philosophy to ensure that they will operate when required The Relay Testing Handbook Creating and Implementing Test Plans outlines step by step procedures that will enable you to create and implement protective relay test plans for modern relay systems ensuring

accurate and efficient relay testing for nearly every application Use the information in this book to Collect and compare drawings settings and engineering studies to evaluate the application Compare all of the available documentation to the manufacturer s literature Prepare to test the relay by correctly isolating it from the rest of the system Establish communication with the relay and apply the settings Properly connect your test set to the relay Perform acceptance tests Design your test plan using conventional test techniques or implement more efficient and effective ones Implement your test plan or apply common test plans for feeder generator or line protection Prepare your report and test sheets This book is included in the hardcover book The Relay Testing Handbook Principles and Practice or it can be ordered by itself as a soft cover book Adobe Acrobat PDF digital download or both Paperback 98 pages Trim Size 8 5x11 Publisher Valence Electrical Training Services LLC Language English ISBN 13 978 1 934348 07 9 LCCN 2012934620      Power System Stability and Control, Third Edition Leonard L. Grigsby, 2012-04-25 With contributions from worldwide leaders in the field Power System Stability and Control Third Edition part of the five volume set The Electric Power Engineering Handbook updates coverage of recent developments and rapid technological growth in essential aspects of power systems Edited by L L Grigsby a respected and accomplished authority in power engineering and section editors Miroslav Begovic Prabha Kundur and Bruce Wollenberg this reference presents substantially new and revised content Topics covered include Power System Protection Power System Dynamics and Stability Power System Operation and Control This book provides a simplified overview of advances in international standards practices and technologies such as small signal stability and power system oscillations power system stability controls and dynamic modeling of power systems This resource will help readers achieve safe economical high quality power delivery in a dynamic and demanding environment With five new and 10 fully revised chapters the book supplies a high level of detail and more importantly a tutorial style of writing and use of photographs and graphics to help the reader understand the material New Chapters Cover Systems Aspects of Large Blackouts Wide Area Monitoring and Situational Awareness Assessment of Power System Stability and Dynamic Security Performance Wind Power Integration in Power Systems FACTS Devices A volume in the Electric Power Engineering Handbook Third Edition Other volumes in the set K12642 Electric Power Generation Transmission and Distribution Third Edition ISBN 9781439856284 K12648 Power Systems Third Edition ISBN 9781439856338 K12650 Electric Power Substations Engineering Third Edition 9781439856383 K12643 Electric Power Transformer Engineering Third Edition 9781439856291      **The Relay Testing Handbook #8D** Chris Werstiuk, 2012-11-08 The Relay Testing Handbook was created for relay technicians from all backgrounds and providesthe knowledge necessary to test most of the modern protective relays installed over a widevariety of industries Basic electrical fundamentals detailed descriptions of protective elements and generic test plans are combined with examples from real life applications to increase yourconfidence in any relay testing situation A wide variety of relay manufacturers and models areused in the examples to help you realize that once you conquer the sometimes confusing andfrustrating man

machine interfaces created by the different manufacturers all digital relays use the same basic fundamentals and most relays can be tested by applying these fundamentals This package provides a step by step procedure for testing the most common differential protection applications used by a variety of manufacturers Each chapter follows a logical progression to help understand why differential protection is used and how it is applied Testing procedures are described in detail to ensure that the differential protection has been correctly applied Each chapter uses the following outline to best describe the element and the test procedures

- 1 Application
- 2 Settings
- 3 Pickup Testing
- 4 Timing Tests
- 5 Tips and Tricks to Overcome Common Obstacles

We will review techniques to test differential relays with 3 or 6 channels so that readers can test nearly any differential application with any modern test set

*The Relay Testing Handbook #6D* Chris Werstiuk, 2009-08 As modern protective relays become increasingly more powerful and complex many relay testers continue to use test procedures and philosophies that are based on previous generations of relays and their limitations Modern relays have very different characteristics that require a different testing philosophy to ensure that they will operate when required The Relay Testing Handbook Testing Overcurrent Protection 50 51 67 provides step by step procedures for testing the most common overcurrent protection applications This volume is designed to help you understand and test

- Instantaneous overcurrent protection 50
- Inverse time overcurrent protection 51
- Directional overcurrent protection 67

Each chapter explains the following topics for each element with realistic practical examples and detailed instructions

- Understanding the application
- Determining which settings are most important
- Recommended steps to correctly plan perform and evaluate pickup tests
- Recommended steps to correctly plan perform and evaluate timing tests
- Preventing interference from other settings inside the relay
- Tips and tricks to overcome common obstacles

This book is included in the hardcover book *The Relay Testing Handbook Principles and Practice* or it can be ordered by itself as a soft cover book

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**The Relay Testing Handbook #3D:** Chris Werstiuk, 2012 As modern protective relays become increasingly more powerful and complex many relay testers continue to use test procedures and philosophies that are based on previous generations of relays and their limitations Modern relays have very different characteristics that require a different testing philosophy to ensure that they will operate when required The Relay Testing Handbook

Understanding Digital Logic explains the different forms of relay logic used in modern microprocessor based relays Each type of relay logic is described in detail with practical examples to demonstrate how relay manufacturers use common relay logic principles applied with different style interfaces such as

- Individual element schemes
- General Electric SR and Beckwith
- Electric Company relays
- Binary relays
- Alstom and Siemens relays
- Arithmetic math schemes
- Schweitzer Engineering Laboratories relays
- Logic schemes
- General Electric UR relays

Use the practical examples outlined in this volume to help you

- Understand and use logic gates such as AND OR NOT NOR NAND and more
- Use logic comparators and timers
- Convert relay

settings from one logic format to another Convert logic schemes into DC schematics to help understand and commission logic systems Understand the protective relay logic used in nearly every in service relay today This book is included in the hardcover book *The Relay Testing Handbook Principles and Practice* or it can be ordered by itself as a soft cover book Adobe Acrobat PDF digital download or both Paperback 90 pages Trim Size 8 5x11 Publisher Valence Electrical Training Services LLC Language English ISBN 13 978 1 934348 06 2 LCCN 2012934619

*AC Circuits and Power Systems in Practice* Graeme Vertigan, 2017-12-18 The essential guide that combines power system fundamentals with the practical aspects of equipment design and operation in modern power systems Written by an experienced power engineer *AC Circuits and Power Systems in Practice* offers a comprehensive guide that reviews power system fundamentals and network theorems while exploring the practical aspects of equipment design and application The author covers a wide range of topics including basic circuit theorems phasor diagrams per unit quantities and symmetrical component theory as well as active and reactive power and their effects on network stability voltage support and voltage collapse Magnetic circuits reactor and transformer design are analyzed as is the operation of step voltage regulators In addition detailed introductions are provided to earthing systems in LV and MV networks the adverse effects of harmonics on power equipment and power system protection Finally European and American engineering standards are presented where appropriate throughout the text to familiarize the reader with their use and application This book is written as a practical power engineering text for engineering students and recent graduates It contains more than 400 illustrations and is designed to provide the reader with a broad introduction to the subject and to facilitate further study Many of the examples included come from industry and are not normally covered in undergraduate syllabi They are provided to assist in bridging the gap between tertiary study and industrial practice and to assist the professional development of recent graduates The material presented is easy to follow and includes both mathematical and visual representations using phasor diagrams Problems included at the end of most chapters are designed to walk the reader through practical applications of the associated theory

*International Conference on Intelligent Computing and Applications* Subhransu Sekhar Dash, Swagatam Das, Bijaya Ketan Panigrahi, 2017-12-28 The book is a collection of best papers presented in International Conference on Intelligent Computing and Applications ICICA 2016 organized by Department of Computer Engineering D Y Patil College of Engineering Pune India during 20-22 December 2016 The book presents original work information techniques and applications in the field of computational intelligence power and computing technology This volume also talks about image language processing computer vision and pattern recognition machine learning data mining and computational life sciences management of data including Big Data and analytics distributed and mobile systems including grid and cloud infrastructure

*Power System Protection* Paul M. Anderson, Charles F. Henville, Rasheek Rifaat, Brian Johnson, Sakis Meliopoulos, 2022-02-15 Ein aktualisierter Leitfaden für den Schutz von Stromnetzen im 21. Jahrhundert Die zweite Ausgabe von *Power System Protection* enthält aktuelle Informationen

ber die technologischen und wirtschaftlichen Weiterentwicklungen beim Stromnetzschutz seit dem Erscheinen der letzten Ausgabe im Jahr 1998 Insbesondere werden die Auswirkungen von Kurzschlüssen in folgenden Bereichen untersucht Qualität der Stromversorgung Mehrere Einstellgruppen Distanzrelais mit vierseitigen Eigenschaften Belastbarkeit Darüber hinaus enthält das Werk umfassende Angaben zu den Auswirkungen von Änderungen der Geschäftsmodelle insbesondere in Bezug auf Deregulierung Disaggregation von Stromsystemen Zuverlässigkeit und Sicherheitsfragen Power System Protection bietet die analytische Grundlage für die Auslegung Anwendung und Einstellung von Netzschutzgeräten für moderne Ingenieure Aktuelle Informationen von Schutzingenieuren mit unterschiedlichen Schwerpunkten runden das umfassende Werk ab das somit sämtliche Aspekte des Fachgebiets erfasst Neue Vorschriften und neue Komponenten die in modernen Stromschutzsystemen enthalten sind werden ausführlich dargestellt Besonders gründlich wird der computergestützte Schutz behandelt sowie die Frage welche Folgen der Anschluss von Anlagen für erneuerbare Energien an Verteilungs- und Übertragungssysteme hat

*Electric Relays* Vladimir Gurevich, 2018-10-03 Electric relays pervade the electronics that dominate our world They exist in many forms fulfill many roles and each have their own behavioral nuances and peculiarities To date there exists no comprehensive reference surveying the broad spectrum of electric relays save one *Electric Relays Principles and Applications* This ambitious work is not only unique in its scope but also in its practical approach that focuses on the operational and functional aspects rather than on theory and mathematics Accomplished engineer Dr Vladimir Gurevich builds the presentation from first principles unfolding the concepts and constructions via discussion of their historical development from the earliest ideas to modern technologies He uses a show not tell approach that employs nearly 1300 illustrations and reveals valuable insight based on his extensive experience in the field The book begins with the basic principles of relay construction and the major functional parts such as contact and magnetic systems Then it devotes individual chapters to the various types of relays The author describes the principles of function and construction for each type as well as features of several relays belonging to a type that operate on different principles Remarkably thorough and uniquely practical *Electric Relays Principles and Applications* serves as the perfect introduction to the plethora of electric relays and offers a quick reference guide for the experienced engineer Electrical Power System Protection C.

Christopoulos, A. Wright, 2013-04-18 The death of Professor Arthur Wright in the summer of 1996 deprived me of a friend and a colleague whose judgement and experience shaped this book I pay tribute to his contributions to protection and electrical engineering education In the five years since the first edition appeared many developments have taken place and it is now necessary to update the book The use of digital communications and advanced signal processing techniques is now widespread and several fully numeric relays are available from manufacturers Two new Chapters 13 and 14 have been added to introduce readers to these concepts and associated techniques Artificial intelligence is making its impact in all engineering applications and power system protection is no exception Expert systems fuzzy logic artificial neural networks

adaptive and integrated protection synchronized measurements using the global positioning system genetic algorithms flexible a c transmission systems are some of the techniques considered in connection with protection Although many of these techniques have not yet found major application in protection it is nevertheless essential for the educated protection engineer to have a basic understanding of the underlying principles and methodology so that he or she can evaluate their suitability for new relaying problems and applications Chapter 15 was therefore added to guide readers through this developing area I have also added some new material in other chapters to reflect changes over the past years

*Offshore Electrical Engineering Manual* Geoff MacAngus-Gerrard, 2017-11-06 Offshore Electrical Engineering Manual Second Edition is for electrical engineers working on offshore projects who require detailed knowledge of an array of equipment and power distribution systems The book begins with coverage of different types of insulation hot spot temperatures temperature rise ambient air temperatures basis of machine ratings method of measurement of temperature rise by resistance measurement of ambient air temperature This is followed by coverage of AC generators automatic voltage regulators AC switchgear transformers and programmable electronic systems The emphasis throughout is on practical ready to apply techniques that yield immediate and cost effective benefits The majority of the systems covered in the book operate at a nominal voltage of 24 y dc and although it is not necessary for each of the systems to have separate battery and battery charger systems the grouping criteria require more detailed discussion The book also provides information on equipment such as dual chargers and batteries for certain vital systems switchgear tripping closing and engine start batteries which are dedicated to the equipment they supply In the case of engines which drive fire pumps duplicate charges and batteries are also required Packed with charts tables and diagrams this work is intended to be of interest to both technical readers and to general readers It covers electrical engineering in offshore situations with much of the information gained in the North Sea Some topics covered are offshore power requirements generator selection process drivers and starting requirements control and monitoring systems and cabling and equipment installation Discusses how to perform inspections of electrical and instrument systems on equipment using appropriate regulations and specifications Explains how to ensure electrical systems components are maintained and production is uninterrupted Demonstrates how to repair modify and install electrical instruments ensuring compliance with current regulations and specifications Covers specification management and technical evaluation of offshore electrical system design Features evaluation and optimization of electrical system options including DC AC selection and offshore cabling designs

**Protective Relaying** J. Lewis Blackburn, Thomas J. Domin, 2006-12-21 Technological advances and structural changes within the electric utility industry mandate that protection engineers develop a solid understanding of the related new technologies as well as of power system operations and economics in order to function proficiently Continuing in the bestselling tradition of the previous editions by the late J Lewi

**Handbook of Electrical Engineering** Alan L. Sheldrake, 2003 Sheldrake offers a practical treatment of power system design within the oil

gas petrochemical and offshore industries He provides a balance between sufficient mathematical theory and comprehensive practical application knowledge      **Synchronized Phasor Measurements and Their Applications** A.G. Phadke,J.S.

Thorp,2008-08-15 This book provides an account of the field of synchronized Phasor Measurement technology its beginning its technology and its principal applications It covers wide Area Measurements WAM and their applications The measurements are done using GPS systems and eventually will replace the existing technology The authors created the field about twenty years ago and most of the installations planned or now in existence around the world are based on their work

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