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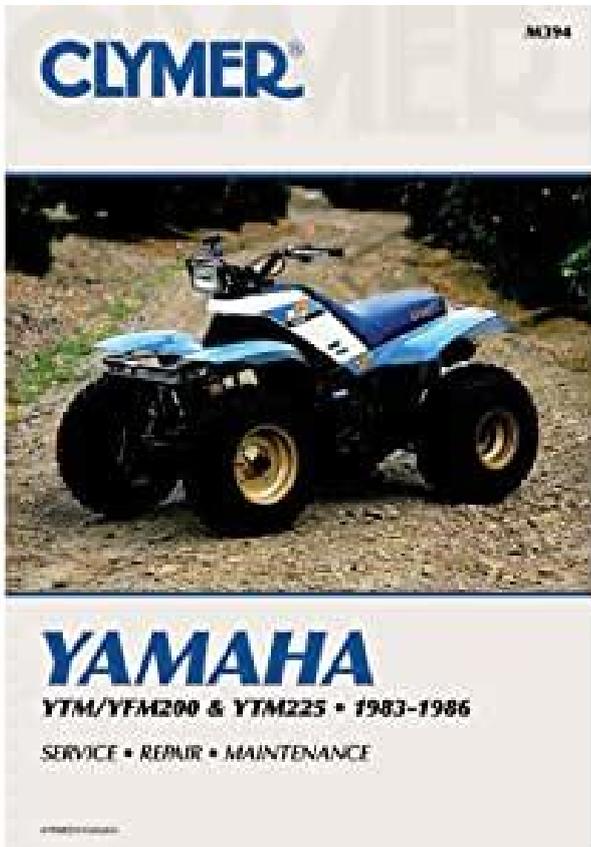
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Cyme Cymgrd Manual



This includes engineering studies, assistance to integration and comprehensive training. And it's absolutely FREE for all CYME users! Informative technical presentations, new features demonstration of the upcoming version of the CYME Software, hands-on sessions and new networking activities are on the agenda. Take advantage of the early bird promotion today, it is valid until March 10 only! Discover the newest developments and enhancements of the CYME Software and see how the CYME services and solutions can bring your projects forward! Driven by its vast user base, the CYME team pushes the envelope of its best-of-breed power system analysis software with the release of CYME 9.0, the first version of a new generation aimed at supporting utilities in their efforts to align their practices with the climate and clean energy goals of the 21st century. Key new features include whether you are new in the field or want a refresher, this Eaton Network Engineering Training is well-suited for all who are required to understand and design network systems. This course is scheduled to take place in September at Charleston, South Carolina, and is led by Eaton's product line manager for network protectors, a senior application engineer and a CYME expert. This year, the Monday engineering course will be about "IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces". It will be presented by Dr. Babak Enayati, PhD in Electrical Engineering, an expert in this field. The course will highlight also see how our services and solutions can bring your projects forward. The entrance to the exhibition is FREE OF CHARGE. Click here to REGISTER. Come and see how the CYME Power Engineering Software solutions and services will meet your power systems modeling needs. Our specialists will be at booth S11 ready to do a demonstration of the CYME Software and discuss how our solutions and services can help you. <http://stopserv.ru/files/brother-650-manual.xml>

- **cyme cymgrd manual.**

CYME CYME 5.02 – Equipment Reference Manual

Power factor It could be positive or negative. A positive power factor will indicate that the generator generates both active and reactive power. A negative power factor will imply that the generator generates active power and **consumes** reactive power.

Profiles... Accesses the optional Energy Profile Manager module and displays the generator profile.

If you have the Harmonic module installed, you will notice that the Induction Generator item in the **Devices** tree list can be expanded to reveal the Harmonic model. This model is discussed in the Harmonic Analysis Users Guide.

Note: Induction generator **cannot** have voltage control.

6.3 Electronically Coupled Generator

6.3.1 Electronically Coupled Generator Properties

Electronically coupled generators are units that are not directly connected to the system. They are connected via inverter-based units such as HVDC links. For electronically coupled generator, the inverter control mode is set such that, during short circuits, the source will continue to contribute a percentage of its rated current.

Rated Voltage Rated Voltage is the generator nameplate voltage, in kV.

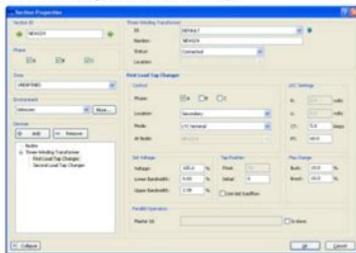
Active Generation This is only a default value. The value that will be used is defined in the Electronically Coupled Generator Settings.

80 CHAPTER 6 – GENERATORS

Come meet our specialists who will give you a demonstration of the CYME Software and discuss how the CYME solutions and services can help you! Discover the newest developments and enhancements of the CYME Software and see how the CYME services and solutions can bring your projects forward! Meet our specialists for demonstrations of the CYME Software and see how CYME services and solutions can be of help to you! We will be back on Wednesday, January 2, 2019. Informative presentations, updates about the latest enhancements of the CYME Software, hands-on sessions and networking activities; once again, the week promises to be uplifting and most useful to the CYME users community. Click here [Key new features include](#) Come and see how the CYME Power Engineering Software is designed to perform key simulations necessary for optimization and maintenance of industrial off and on shore power networks. It will be presented by Roger Bergeron, eng., expert in this field of expertise. More details on my.cyme.com. Come and see how the CYME software can tackle the issues related to secondary and spot networks. Informative topics, updates about the latest advances of the CYME software, hands-on sessions and networking activities; once again, the week promises to be uplifting and most useful to the CYME users community. Take advantage of our Early Bird promotion! Discover the newest developments and enhancements of the CYME Software and see how the CYME Solutions and Services can bring your projects forward! We will be back on Tuesday Jan 2, 2018. We have perfected a number of the CYME algorithms; introduced new modules, enhanced the equipment and network modeling and enriched the interface to provide the users with the best experience possible. The main new features of CYMCAP 7.2 include This new series will invest in DER-related tools, address emerging trends and focus on network planning and operation topics. http://www.vinaconexmec.vn/uploads/news_file/brother-6500-manual.xml

5.4.3 First/Second Load Tap Changer

If you entered data for a Load Tap Changer when you created the three-winding transformer in the equipment database, then the Load Tap Changer sub-layers will appear directly under the Three-Winding Transformer – At Middle layer.



Location	To indicate on which side of the transformer the Load Tap Changer is connected. For the First Load Tap Changer, it is Primary or secondary. For the Second Load Tap Changer, it is always tertiary.
Mode	The different methods to obtain the settings for the transformer. See Operating Mode in chapter 4.3 Regulator Control.
At Node	Enabled when the mode "Load Center" is selected. Location for which the LTC will control the voltage.
LDC settings	R: Resistive voltage drop on the line between the transformer and the load location. X: Reactive voltage drop on the line between the transformer and the load location. They represent the voltage drop on the line when the line is carrying CT-rated primary current.
Set Voltage	These values are in percentage of the system base voltage at the secondary of the transformer.
Use last load flow	To consider the last position of tap after a load flow analysis when the LTC was active.
Initial	Enter the initial tap position if you are not using the "Use last load flow" option.

Userfriendly data entry, efficient analysis algorithms and powerful graphical facilities make the CYMGRD software an efficient tool which helps engineers arrive at technically sound and economical designs. Delegates from more than 50 utilities participated to different activities during the week and shared experience and knowhow among peers. We had much interesting discussions with our participants, and their inputs will continue to help us polish our software and build our roadmap to deliver a software which addresses emerging issues that are important to our clients. We hope that our participants find the experience as inspiring as we do. Backed by popularity, the Early Bird Promotion has been extended to Friday April 1st register today and come join us at the Users Group Meeting in June 2016! Program Features The use of CYMGRD allows for the rapid analysis of various design alternatives to choose an economical solution for any particular installation. Userfriendly data entry, efficient analysis algorithms and powerful graphical facilities render. You are not permitted to use the Cooper Trademarks without the prior written consent of Cooper Industries. All Rights Reserved. CYMVIEW is common to all simulation modules that generate any kind of charts. CYMVIEW is capable of managing the outputs of different modules including CYMGRD. CYMGRD assists engineers to design grounding facilities fro substations and buildings. In no event shall CYME be liable to anyone for special, collateral, incidental, or consequential damages in connection with or arising out of purchase or use of these materials. The sole and exclusive liability to CYME, regardless of the form of action, shall not exceed the purchase price of the materials described herein. CYME reserves the right to revise and improve its products as it sees fit. This publication describes the state of this product at the time of its publication, and may not reflect the product at all times in the future.

The software described in this document is furnished under a license agreement. The program can be used to perform soil resistivity measurement interpretations, elevation of ground potential rise and danger point evaluation within any area of interest. The program supports soil resistivity analysis taking into account field measurements, an analysis necessary to arrive at a soil model that will subsequently be used for the analysis of the potential elevations. The module supports both "singlelayer" and "twolayer" soil model analysis. The same module also computes the tolerable Step and Touch Voltages per IEEE Standard 802000. The user defines the prospective fault current magnitude, the thickness and resistivity of a layer of material such as crushed rock applied to the

soil surface, the body weight and the anticipated exposure time. CYMGRD is capable of performing ground electrode sizing and ground potential rise calculations. CYMGRD can also determine the equivalent resistance of ground grids of arbitrary shapes that are composed of ground conductors, rods and arcs since it employs matrix techniques for resolving the current distribution to ground. CYMGRD calculates surface voltage and touch voltage potential gradients at any point of interest within the area of investigation. Colorcoding is used to view the results. These can be displayed in either two or three dimensions, making it easy to evaluate the safety of personnel and the equipment in and around the grounding grid. Installing CYMGRD The CYMGRD package requires a license to operate. You may, however, install the CYMGRD package independent of the license. Installation steps 1. Start Microsoft Windows. 2. Insert the CYME CD into the CDROM reader. If installing the WEB based package, open the executable and proceed to step 7. 3. The installation program should start automatically after a few seconds. If it does not start by itself, use Windows Explorer to inspect the main directory of the CYME CD.

<https://congviendis.vn/vi/bose-controller-manual>

Locate the icon "Setup32" and doubleclick on it. 4. Click on the option to "Install Products or Demos". 5. Choose English and then your version of Windows. 6. Choose CYMGRD from the list of software names. 7. Follow the prompts and screen instructions. 1.4 CYMGRD modules The functions outlined in the General Introduction section 1.1 can be performed using the following modules Soil Analysis module includes Safety Assessment Defines either a twolayer, a uniform, or a userdefined soil model CYMGRD plots the measured and calculated resistivity on the same graph to allow easy verification of the quality of the soil model. The maximum allowable step and touch voltages are calculated according to IEEE Standard 802000. The results are automatically communicated to the other modules. To determine the electrode size, CYMGRD uses the parameters of the electrode material and the ambient temperature setting. Users can select one or more of the materials from the CYMGRD library. A number of parameters for the materials can be modified and retained on a perstudy basis. Grid Analysis module Calculates the current diffused by every element of conductor in the grounding grid. The potential at the soil surface is determined from these results. You can define the grounding rods in a similar way. Potential Contour plots can be used to display both touch and surface voltages. Both representations can be colorcoded in 2 or 3 dimensions. Potential Profile plots can be used to display both step and touch voltages along a straight line, in any desired

direction. The voltage variations, along with the corresponding maximum allowable voltages, can be shown simultaneously on the same graph. Both Potential Contour and Potential Profile graph types allow for easy identification of hazardous areas i.e. areas where tolerable voltages are exceeded. These graphics can be sent to a printer, a plotter or copied to the Windows clipboard. 1.

<http://iprep-u.com/images/Deacon-Ministry-Manual.pdf>

5 Firsttime user If you have not used CYMGRD before, we suggest you read this manual before performing a grounding study, to familiarize yourself with the capabilities of the program. Illustrated stepbystep examples have been included in Chapter 5 to assist you in the utilization of CYMGRD. Please refer to the contents of this file before operating the program. 1.6 Interactive data entry CYMGRD features a modern multiwindow interface for data entry. A spreadsheet is used to enter the data about station layout, soil resistivity, bus, and electrode sizing. Any remaining data is provided via standard dialog box entries. Please note Besides interactive data entry, the program remains backwards compatible with earlier releases. All cases entered via earlier Windows versions can be directly imported. In the unlikely case where users are interested in importing cases entered with the DOS version of the package, they should contact Customer Support for further assistance. The studies may be variations on a design theme towards optimizing a grid design. The second step is to determine the soil model that will be used for the subsequent analyses. This is done using the Soil Analysis module. It is the same module that performs the Safety Assessment calculations, thus yielding the maximum permissible step and touch voltage for particular surface and exposure conditions as defined in IEEE Standard 802000. The third step is to determine the electrode sizing conductors and rods taking into account the worst single line to ground fault parameters in the substation and material of the electrodes. The fourth step is to actually enter the geometrical configuration of the station layout. All electrodes conductors and rods need to be entered with their exact coordinates, burial depth and physical dimensions. Please refer to Chapter 7 for more details. The final step is to make certain that the design for the station meets the necessary safety criteria.

<https://mariamsagir.com/images/Deacons-Handbook-Manual-Stewardship.pdf>



This can be accomplished through direct inspection of the danger points on the surface. Entire areas may need to be verified by generating Potential Contours plots of the touch voltages, particularly near the grid edges. Finally, Potential Profiles plots should be generated to ascertain that touch and step potentials are not exceeded. If any of the safety criteria is not met, the grid design may need to be reinforced or modified. These elements are the basic units that diffuse the injected fault current to ground. Using a higher number of smaller elements may give greater precision. There are cases for which increasing the number of elements may result in higher accuracy. This is not, however, necessarily the case despite the fact that the computational burden increases considerably whenever the number of elements is increased. An increased number of elements does not necessarily mean a more accurate estimate of neither the station resistance nor the ensuing surface potentials. A general rule of thumb is to begin by creating a study using one or two elements per grid conductor assuming the conductors physical length does not exceed 1 meter. In this case, the dialog box shown provides the possibility to define a new Study, as well as a new Project that will contain the study. A browse function is activated that lets you see the various Projects already created in the active folder. The CYMGRD interface is subdivided into dedicated sections that occupy specific regions within the overall display. It is reserved for the Studies and the corresponding Project file, shown in a tree structure. If more Studies were included, they would be shown as part of the root Project. The active Study is shown using a red checkmark as part of its icon. Note that this window features 3 tabs. Thus, the second and third tabs are contextsensitive and dependent on the first tab. The Installation View contents appear only when data is has been entered for the station layout.

It is reserved to show the Grid Layout, Soil Model and Potential Contour and Profile plots generated during the simulation. It is the main display area of the application. It is used for data tabular input. It is used to display the reports pertinent to all analysis options. It is however more common to find that soils are stratified i.e. composed of layers having different resistivities. In general, to identify the exact soil stratification is a difficult problem. Many approaches have been suggested over the years, both graphical and analytical, but on many occasions, a judgment call will need to be made in order to arrive at practical soil models. There are currently techniques to interpret a set of soil resistivity measurements as a multilayer soil model. The Twolayer model has an upper layer of a definite depth and a lower layer of an infinite depth and with a different resistivity. The approach is a practical one and has been followed for many years in substation grounding practice. Of the various soil measurement techniques, CYMGRD supports only the Wenner technique, in which the distance a between each pair of probes is equal. A current I is injected and the resulting voltage V is measured by the voltmeter. The module will find 1 , 2 and h according to the mathematical equations described below. The results will be automatically communicated to the Grid Analysis module, which calculates the surface potentials. CYMGRD identifies measurements that do not seem to fit very well the computed resistivity function. In order to try to improve the accuracy of the soil model, you may remove one or more such measurements from the input data and run the analysis again. You must enter at least three measurements for twolayer soil. CYMGRD can accept a maximum of 100 measurements. Note that any of the measurements can be disabled using the checkmark in the dedicated column. This is where you can remove any suspect measurements before recalculating the soil model.

<https://eske.hu/wp-content/plugins/formcraft/file-upload/server/content/files/16289cd773a7d7---cannon-eos-rebel-x-35mm-manual-pdf.pdf>

The soil model is seen graphically in the Workbook view. Any measurements that the simulation found departing from the average RMS errors that resulted from the optimization fit are marked with an "X" on the graphic. You can track the curve values with the mouse. Select any point on the curve with the cursor to see the probe distance and the calculated apparent resistivity values. The measured and calculated resistivities for the provided probe spacing are listed along with the associated errors. You can enlarge the Report view section by dragging the split bar to the position you want. The reports are shown here for illustration. The calculated soil model results are translated in the written report. This, actually, is a very good way of verifying the soil model that the program has in memory before proceeding with the potential rise calculations. For a twolayer soil model, the program calculates the resistivity of the upper and of the lower layers of soil, along with the thickness of the first layer or upper layer. The module provides the options of interpreting the soil measurements as a twolayer soil model or as a uniform model. If a uniform soil model is selected, the program will provide only one soil resistivity value, which is the average of all the entered measurements. Please note CYMGRD no longer supports the function of entering the Soil data as part of the Grid analysis as some earlier versions did. Thus, the Soil data can no longer be bypassed if new soil data are to be used for analyzing the same grid. Whenever one or more measurements are changed a new calculation must be performed. The safety assessment calculations comply with standard North American practice as described in the 'IEEE Guide for Safety in AC Substation Grounding', 2000 edition. Protection reaction time. CYMGRD uses the following equations, taken from IEEE 802000, to calculate the maximum permissible touch and step voltages.

The reduction factor C_s is a function of the reflection factor k and the thickness of the upper layer h . P_s is the resistivity of the surface material in ohmm. This safety assessment data is defined in the same dialog box that specifies the soil model data. The purpose of the calculation is to arrive at a "derating" factor that will permit to take advantage of the high resistivity surface layer, thus permitting a higher touch voltage to be tolerated. The derating factor C_s can either be calculated or obtained from graphs according to the IEEE 2000 Guide. Actual potential rise analysis of the grounding assemblies takes into account only the native soil resistivity model reported by the Soil analysis. Once this is selected you will need to specify the directory in which the projects that are to be updated reside. Please note Only one project at a time can be imported. All studies within the selected project will be automatically imported as well. If a project has already been imported into version 6.00 or higher, OR has been constructed using the version 6.00 or higher of the application, an asterisk will be shown under "Exists" to show that there is no need for the import operation to take place for this particular project. Start by running the old version of CYMGRD and open the Project you wish to import. Then, verify the Project number indicated at the right of the Project title on the status bar at the bottom of the application window. The number in question is shown in white with a gray background. This value represents the extension of the project file on your hard drive i.e. grdprj.001. It will also be necessary to note the working directory for the Project on the title bar at the top of the application window. You should see one or more files with the name grdprj but with different extensions.

Selecting and opening the one with the same extension as the Project number from the old version of CYMGRD, should import the contents of your Project into the application. At the same time, a file with the same name as the Project name from the previous version of CYMGRD, but with the extension cgp, will be created in the working directory. Please note This alternative technique can be used if, for any reason, the directory cannot be scanned with the previously described technique. Only one project can be imported at the time, importing along all the studies within that project. The

first type is the 'Primary' electrode and is the electrode that absorbs the grounding current. The second type is called the 'Return' electrode and is used to model electrodes. If there is no Return electrode all the current absorbed by the primary electrode would have been diffused to ground. Finally, the third type, the 'Distinct' electrode, is not connected to the primary or the return electrode but may be subjected to the influence of their electric fields. Although Return and Distinct electrodes are not often found as components of a grounding system, it is sometimes necessary to represent them. You may build it up out of conductors and rods. The vast majority of grounding studies will consider only the Primary electrode. The presence of a Return electrode will alter the surface potential distribution. You can model the Return electrode in the same way that you model the primary electrode. Even a single rod can serve as a Return electrode. In addition, you must enter the current absorbed by the return electrode, in Amperes. This value must be negative. You model the Distinct electrode in the same way that you model the Primary electrode. Even a single rod or buried conductor can act as a Distinct electrode. No Return electrode should be modeled in the absence of a Primary electrode.

By using a Splitfactor, CYMGRD takes into account Return current via the locally grounded transformers, transmission line and distribution feeders. If the substation fence is not bonded to the grounding grid, model the fence posts as parts of a Distinct electrode. Otherwise, model them as part of the Primary electrode. You must define whether or not all elements of the Distinct electrode have the same potential. They have the same potential if they are connected together. If the Distinct electrode is comprised of insulated sections, they do not have the same potentials. Please note CYMGRD does not use the following parameters for Electrode Sizing, however, in order for the bus data as a whole to be saved, they must be supplied. This factor is used to take into account the DC components, resulting in the asymmetrical fault current for the corresponding fault duration. The following image shows the CYMGRD ground conductor library "Electrodes" tab. Chapter 3 The Grid Analysis Module 25 CYMGRD 6.3 for Windows Please note Certain parameters, such as the Melting Temperature T_m can be modified in order to better define the materials in use. If a twolayer soil model is used, then the grid conductors must be located in the upper layer. Grid rods may cross the twolayers boundary. Important factors for the calculation of station resistance are the station geometry and the soil model as determined from the Soil analysis. When calculating the Ground Potential Rise, the injected current needs to be known as well. That same dialog box allows the user to specify the attributes of the Distinct electrode and specify the current for the Return electrode. The single linetoground fault current I_{LG} at the fault location produced by the substation, does not necessarily flow to the ground via the grid.

The fact that only a part of the total fault current usually flows between the grounding system and the surrounding earth has implications on both personnel safety and equipment requirements. The current split factor is a ratio based on the portion of the I_{LG} current that goes back to the remote sources via the ground grid. The equivalent resistance in parallel with the grounding grid, Z_{eq} , is the total equivalent resistance in ohms of the sky wires and counterpoises of all the lines connected to the substation. The I_{LG} fault current is divided between these two resistances R_g and Z_{eq} . The following equation shows the relationship between Split Factor S_f , Z_{eq} and Ground resistance. Please note To direct the entire ground fault current into the grid, without any current division, set the Z_{eq} Userdefined to 9999. If not, the current is 0. 28 Chapter 3 The Grid Analysis Module CYMGRD 6.3 for Windows If you change any of the electrodes after performing an analysis, you will have to reanalyze the ground potential rise and grid resistance. Grid conductors cannot bridge two soil layers if a twolayer soil model is used. However, Rods can bridge the two layers of the soil model. 3.5 Entering the Grid data Ground Grid data can be entered by either specifying directly their geometrical coordinates or can be imported from an AutoCAD file formatted for use with CYMGRD. This section describes data entry for the case where AutoCAD data files are not available. All are explained in the following subsections. CYMGRD assumes that

symmetrically arranged grid conductors are buried horizontally and are oriented along two perpendicular axes the X and Y axes in the graphic window. The spacing between the conductors is assumed to be equal along each axis, but the spacing along the Y axis can be different from the spacing along the X axis. Chapter 3 The Grid Analysis Module 29 CYMGRD 6.3 for Windows Symmetrical Conductor data is shown above.

For this example, we have used the symmetrical conductor arrangement to represent the lower rectangular part of an L shaped grid. Please note If the electrodes Conductors or rods placed in the grid cannot satisfy a placement pattern with some symmetry, then they should be defined using asymmetrical electrodes. 30 Chapter 3 The Grid Analysis Module CYMGRD 6.3 for Windows 3.5.1 Asymmetrically arranged grid Conductors An asymmetrically arranged conductor is a single straight conductor stretched between two points defined by two coordinates X1, Y1, Z1 and X2, Y2, Z2. Asymmetrical conductors that are slanted may be represented in the model Z coordinate, which is not the case for the symmetrical arrangements, which are entered using a common burial depth X,Y. Furthermore, each conductor may have a different diameter, which is not the case for the symmetrical arrangements with a common diameter for all conductors. Asymmetrical conductor data is shown above. For this example, we have used the asymmetrical conductor arrangement to represent the upper left protruding part of an L shaped grid. Conductors may be inclined with respect to the soil surface, which CYMGRD assumes to be horizontal. All rods defined in the same array have the same burial depth, length and diameter. Symmetrical rod data is shown above. The position of the first rod is given by the coordinates X1, Y1, Z1 and the position of the last rod in the row is given by the coordinates X2, Y2, Z2. The upper end of each rod lies on the straight line between these two points. All rods defined in the same array have the same length and diameter. Asymmetrical rod data is shown above. For this example, we have used the asymmetrical rod arrangement because all the rods placed in the grid were strategically positioned at specific coordinates. It is seen in the data that Chapter 3 The Grid Analysis Module 33 CYMGRD 6.

3 for Windows we have entered the rods one at a time using different coordinates for the beginning and the end points. Chapter 3 The Grid Analysis Module 35 CYMGRD 6.3 for Windows Please note A positive value of Z denotes a position below the surface of the soil for all electrode types and arrangements. No negative Z is permitted. Both ends of an asymmetrical grid conductor must be in the same soil layer. Only ground rods are permitted to bridge two separate soil layers. If a check mark is shown the component is enabled. To disable it remove the check mark. Reviewing and verifying the data Any spreadsheet entry can be highlighted on the station layout drawing for verification and inspection. In order to do that, the appropriate cell on the far left column needs to be highlighted. It is the column that shows the entry number of the component. When you select a conductor in this fashion, it is highlighted in yellow on the grid layout, so that you may see which electrode you have selected. Please note Data files from earlier DOS versions of CYMGRD can still be imported. CYMGRD does not save station data in dedicated files. Instead, they constitute an integral part of the entire study. 3.8 Overlapping conductor elements CYMGRD cannot perform a station analysis if conductor elements are found to overlap each other. If overlapping elements are found during execution the calculations will stop and an appropriate error message will be generated indicating which components overlap. Common errors causing that condition are duplicates of either asymmetrical conductor elements or grounding rods that are placed one on top of another. When the duplicate is disabled or removed from the grid design, the problem should be alleviated. The time bar at the bottom of the desktop provides an estimate of the time required to complete the analysis. It is seen that, at first, the soil model used in the calculations is echoed in the report.

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