NADIR
USER'S GUIDE

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MADE - V 4.20

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1 SAFETY INFORMATION

1.1 Safety recommendations:

Please read this manual carefully before unpacking, configuring or using this equipment. Note all indications of danger and other warnings. The failure to observe these recommendations could result in serious injury to the operator or could damage the equipment. To ensure that the protection provided by this equipment is appropriate, do not use or install it other than in accordance with the conditions indicated in this manual.
Dismantling the cases is forbidden. This operation is limited exclusively to personnel qualified by MADE.

1.2 Following the safety recommendations:

DANGER: Indicates a dangerous or potentially dangerous situation which, if not avoided, could cause serious or deadly injuries.

NOTE: Indicates a potentially dangerous situation which could cause superficial to moderate injuries.

Remark: Information that merits mention.

1.3 Warning labels

Read all labels and wordings shown on the instrument. Bodily injury or equipment damage could occur if these instructions are not respected.

	Symbol requiring reference to the instruction manual for instructions concerning operation or safety recommendations
	Dangerous Voltage
	AC current
IP 22	IP standard – Protection against dust and water : TRANSMITTER
IP 65	IP standard – Protection against dust and water : RECEIVER

1.4 Dangerous environments

DANGER:

Even though some of the systems supplied by MADE are designed and certified for installation in dangerous environments, several MADE systems are not intended for use in such environments. It is incumbent upon those who install these systems in dangerous environments to determine the acceptability of the system for its environment. Additionally, to guarantee safety, the installation of systems in dangerous environments must be compliant to the order specification of the manufacturer. Any modification of systems or their installation is not recommended and could cause deadly injuries and/or damage to facilities.

2 OVERVIEW

NADIR is used for :

- The **PRE-IDENTIFICATION** of a cable and core in an excavation
- The **LOCATION** of the corresponding feeder and phase in a substation.

These operations are carried out on a **powered LV network under load**.
The operating principle of **NADIR** is that the **Transmitter** draws a complex signal down the LV feeder, with no disturbances for the connected loads. This signal will be found between the **Transmitter** connection point and the power source; i.e.: Substation.
This signal is analysed digitally in the **Receiver**, which enables the user to discriminate between cables and phases.

NADIR is supplied in a carrying case holding:

- A **Transmitter** and connections
- A **Receiver** with an integral transducer and two remote transducers.

3 NADIR COMPONENTS

TRANSMITTER :

- Carrying case with Integral transmitter.
- 1 Cable for the connection to the network (phase-phase or phase-neutral)
- 2 crocodile clips
- 1 UK mains lead

RECEIVER :

- Polycarbonate cased hand-held with display screen and integral cable transducer.
- Remote transducer for cable pre-identification
- **MADE-Flex** (Rogowski coil) for locating the phase(s).

4 NADIR TRANSMITTER

The **Transmitter** is connected, using the crocodile clips or mains lead provided, either between any two phases, or between any phase and neutral on the feeder, downstream of the point of interest.

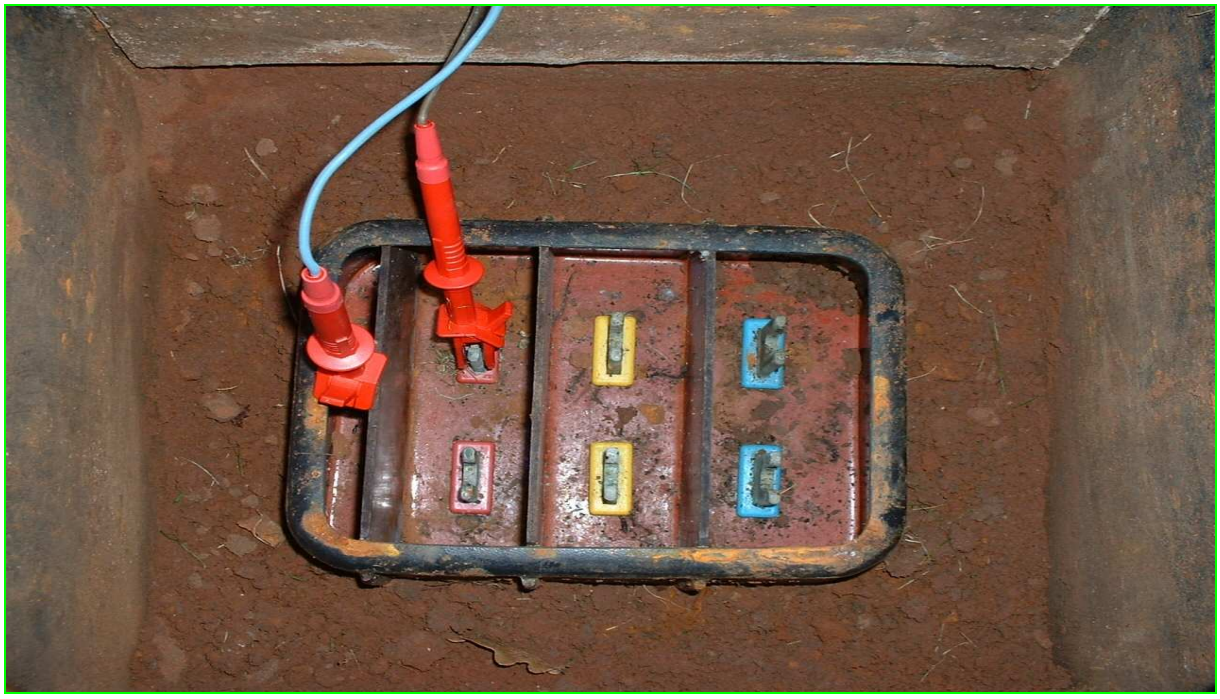
THE TRANSMITTER AUTOMATICALLY ADJUSTS TO THE VOLTAGE SUPPLIED.

- Turning **ON** the **TRANSMITTER** :
  - Connect the 2 crocodile clips between PHASE and NEUTRAL or between PHASES, depending on the kind of network (The fan starts)
  - Pressing the TRANSMITTING push button once starts the transmission
  - The **yellow** TRANSMITTING LED flashes showing that there is transmission
  - Close the cover, do not try to lock it
  - Measurement can now begin with the RECEIVER.

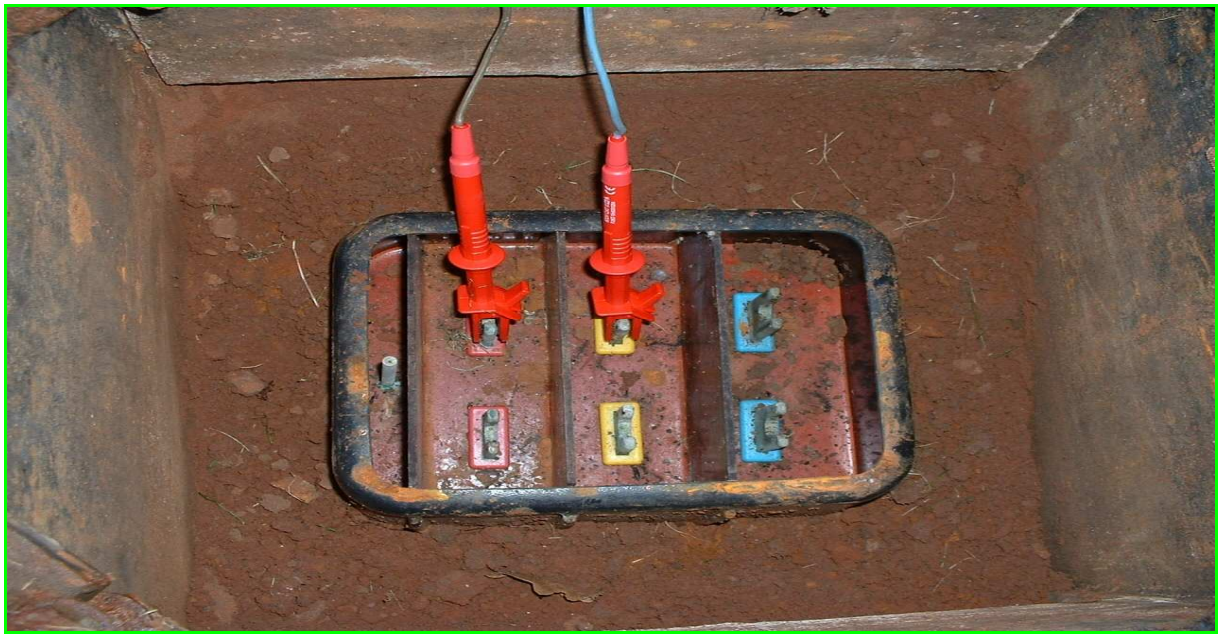
One of the two **red** LEDs indicates the level of the supply (230 V or 400 V), and the **green** LED indicates that the transmitter is powered.
If there is an internal fault, the **red** FAULT lamp will light. Should this occur, turn **OFF**, check the connections and re-start. If the fault persists, contact: NIS, A. T. M. S. or the manufacturer.
The **NADIR Transmitter** monitors its internal voltages, the cooling fan and the overall operation.
So as to improve reception, try to connect the **Transmitter** as close as possible downstream of the point of interest.

- **Stopping** the **TRANSMITTER** :
  - Press the push button used to turn ON the Transmitter.
  - The **yellow** LED stops flashing, the cooling fan is still running
  - Disconnect the crocodile clips from the network, the fan stops.

4.1 Connection of the Transmitter



Phase-to-Neutral connection in a link box



Phase-to-Phase connection in a link box

5 NADIR RECEIVER

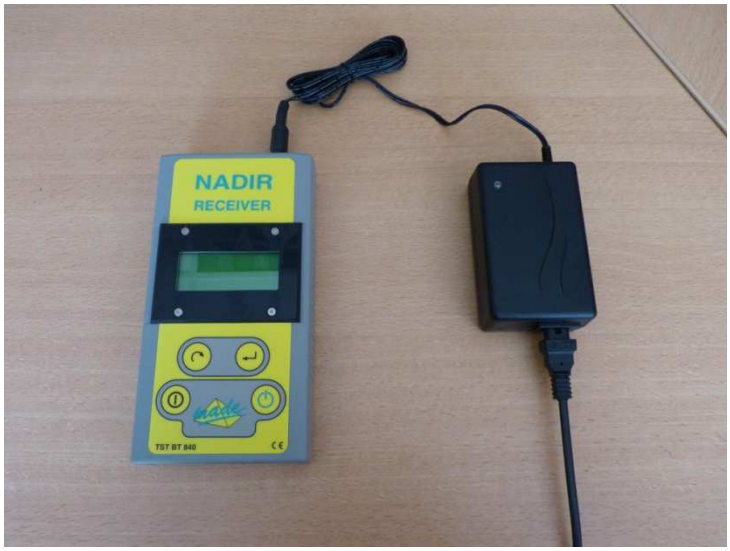
The **Receiver** assembly is stored in the carrying case and includes :

- The **Hand-held** with control buttons and display with an integral cable identification transducer
- The remote **Cable Pre-identification** transducer
- The **MADE-Flex** Rogowski coil transducer for Phase identification.

5.1 Batteries

The NiMH type battery pack is within the receiver.
To recharge the battery :

- Connect the charger to the mains (230 V ac~)
- Connect the charger to the **NADIR** Receiver, the **red**/**orange** LED illuminates
- At the completion of charging, the LED changes to **green**.



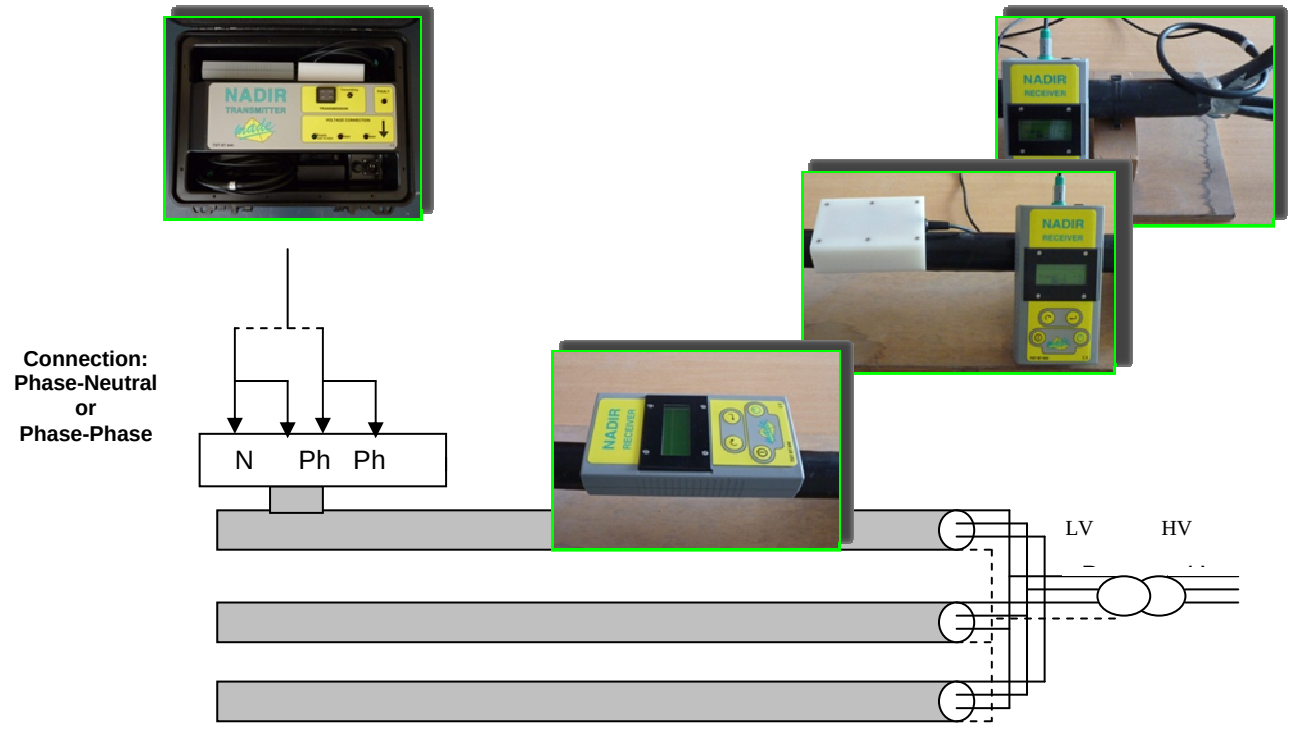
Receiver battery life: 5 hours in normal use.

Charging time: 4 hours (when completely discharged).

When the **Receiver** detects that the charge level has fallen to 20 %, the charging led flashes and the receiver turns OFF after 5 seconds.
Then the Receiver must be recharged.

6 NADIR OPERATION

6.1 OVERVIEW



6.2 CABLE IDENTIFICATION

A preliminary search is made to locate the cable or conductor giving the maximum signal. The identification may need to take into account external parameters which can only be determined by the operator.

To identify a cable, there are two possibilities:

- Use the external transducer when it is difficult to read the display whilst measuring with the internal transducer.
- Use the internal transducer in other situations.

Procedure :

- Make a pre-search by observing the bargraph in quick measurement making steps of about 20 cm along the cables or conductors over a length of about 1 m.
- One of the cables should give a signal level significantly greater than the others.
- Then confirm the result on this cable at several points with precise measurements by pressing  .

It is best to make several measurements as the signal level is not constant along the cable and depends, at any given point on the **instantaneous charge** and the variation of relative positions of the

conductors carrying the signal due to the spiral lay up of the cable. **In any case, a signal level below 10 % is insufficient for a clear identification of a cable.**

Typical signal levels are found to be between **35** % (depending on the network and the connected loads) and **100**%.

The preliminary quick search using the bargraph only enables the elimination of the cables or conductors with no signal, and should not be used alone to identify the correct cable or conductor, which should be done in precise measurement mode.

6.2.1 Using the internal transducer

This is automatically in use if no other transducer is connected.

Correct Position

Incorrect Position

6.2.2 Using the remote transducer

Using the remote transducer is a more flexible alternative to the internal sensor, giving more positional freedom in cases where access to the cable with the receiver is difficult, or the receiver position hides the receiver screen.

6.3 CONDUCTOR IDENTIFICATION

This is done using the **MADE-FLEX** (Rogowski coil) transducer.

Note :

- Take one conductor at a time, never the complete cable.
- Snap the coil closed around the conductor**.**

Use of the MADE-FLEX for the identification of a phase :

Rogowski Coil (MADE-Flex)

The coil must encircle the core to be identified; for best results check that the coil is properly closed. **Only one conductor should be in the coil for each measurement**.

7 NADIR RECEIVER USER'S MANUAL

7.1 General Information

- The signal emitted by the transmitter is only on 2 conductors (2 phases or phase/neutral) in the cable, which is the reason for repeating the measurements at several points along the cable in order to avoid points of signal null (a measurement each 20 cm over a 1 meter length should suffice).

- When used at low temperatures between -5℃ and -20 ℃: the « EMISSION » switch can be more difficult to move, in which case do not hesitate to press firmly. Otherwise the display requires a short time (~5s) to become perfectly legible after each content update, notably at start-up.

7.2 Buttons Functions

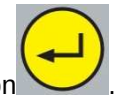
Turns on the Receiver

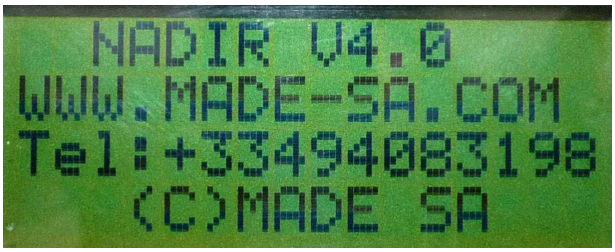
Turns off the Receiver.

Turns on/off the screen backlighting.

Starts a precise measurement.

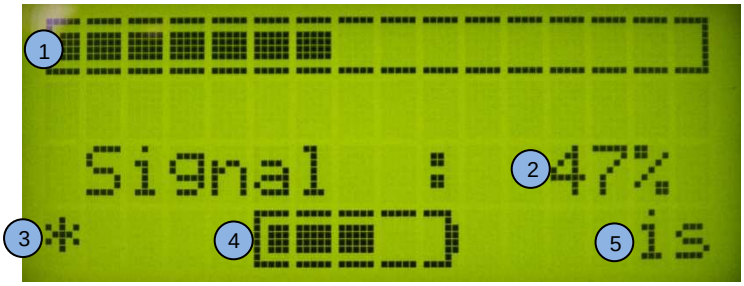
7.3 Start-up screen

On start up the screen shows the software version as well as the address of MADE-SA, to retain this information 5 further seconds press this button  .



7.4 Measurement screen

After the start-up screen the instrument changes automatically to the measurement screen.



Captions :

1	Signal level in quick measurement
2	Signal level in precise measurement in %
3	Backlighting state (If the symbol is present, ON, if not OFF)
4	Receiver battery level
5	Type of transducer in use (**is**: internal coil, **es**: external coil, **rc**: Rogowski coil)

In the measurement screen, the instrument measures continuously and updates the display of the quick measurement (1), allowing a rapid preliminary search over several cables or conductors. There is an audible signal with a frequency rising with the detected signal level and display, on the cable or the conductor.

Pressing this button  starts **a precise measurement**; the result of this measurement is given as a percentage of the maximum level detectable (100%). **This level is significant if it exceeds 10% and depends on the position on the cable and the load.** The result is displayed at (2). This field always indicates the value of the last precise measurement and not the value of the quick measurement. During a precise measurement the audible signal is stopped until the result is displayed.
Do not move the transducer until the measurement is completed (~5 seconds).

On the last line is the battery symbol (4) indicating the remaining charge, each graduation represents a maximum of 20%. In the lower right corner (5) an abbreviation indicates the type of transducer in use -:

- « **is »** for internal cable sensor.
- « **es »** for external cable sensor.
- « **rc »** for the Rogowski coil.

8 TECHNICAL CHARACTERISTICS

- Total weight : 12,35 kg
  - Transmitter : 10,65 kg
  - Receiver : 0,7 kg
  - Charger : 0,3 kg.
- Dimensions :
  - Transmitter : 470 x 380 x 200 mm
  - Receiver : 195 x 100 x 40 mm.
- Transmitter supply :
  - 230 V /400 V~ 50Hz
  - Consumption : 2 A
  - Front face fuse : power section : 10 A HPC
  - Operating Voltage ranges : 185 V to 250 V single phase
    350 V to 420 V in inter phase.
- Receiver supply :
  - Internal battery
  - Autonomy: 5 hours in normal use.
- Harmonised Standards :
  - CEM Standards
  - NF EN 61 000-6-1
  - NF EN 61 000-6-3
  - NF EN 61 000-3-2
  - NF EN 61000-3-3
  - NF EN 61243-3
  - NF EN 60529
  - NFC20-030
  - ST BT 840 ind. C November 2000

CE

9 MAINTENANCE

Dismantling systems is forbidden. This operation is limited exclusively to personnel qualified by MADE.

Never use solvent, or a solvent-based product, to clean the system and / or its accessories.

For cleaning and maintenance of **NADIR**, it is sufficient to :

- Check that the **Transducers** are clean : wipe off with a dry cloth
- Do not use corrosive products to clean the instrument faces
- Use only the accessories delivered with the system
- Follow a training programme by a qualified person
- In the event of a technical problem, request assistance from : Norwich Instruments, A. T. M. S. or MADE-SA
- An annual inspection can be carried out by Norwich Instruments or the manufacturer covering-

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  - Any system failure
  - The calibration of transmitter & receiver
  - Battery state check
  - Transducer checks
  - The overall condition of the **NADIR** instrument**.**

Recycling the receiver batteries: when changed in our workshops, we will re-cycle these batteries.

10 RECYCLING

In accordance with the decree n°2005-829 of July 2 0, 2005 relating to the waste disposal of electrical equipment and electronic (WEEE), the user ensures and takes responsibility for the collection and the elimination of the WEEE under the conditions of the articles 21 and 22 of this decree.

11 GARANTEE

MADE guarantees this product, to the initial purchaser, against all material or functional failure during a period of one year from the date of delivery, unless otherwise indicated in the product manual. If a defect is discovered during the period of the guarantee, MADE agrees, at its choice, to either repair or replace the deficient part, excluding the expenses of handling and of initial delivery. All parts repaired or replaced under the terms of this agreement will be guaranteed only for the remainder of the period of initial guarantee of the system.

11.1 Limitations

This guarantee does not cover:

• Damage caused by a "cause beyond control", natural disasters, strikes, wars (declared or not), terrorism, social conflicts or any acts under governmental jurisdiction
• Damage due to misuse, to carelessness, to any accident or an unsuitable application or installation
• Damage caused by a repair or an attempted repair not authorized by MADE
• Any product that is not used in accordance with the instructions provided by MADE
• Cost of transport back to MADE
• Cost of transport by express delivery of parts or products under guarantee
• Cost travel for a repair on site under guarantee

This guarantee constitutes the unique explicit guarantee established by MADE for its products. All implied guarantees, including, but not limited to, guarantees on the commercial value of the product and its suitability for a particular use are positively rejected.
The present guarantee confers certain rights : the legislation of the country or jurisdiction can grant others. This guarantee constitutes the final declaration, complete and exclusive, of the terms of the guarantee and nobody is allowed to give other guarantees or promises on MADE's account.

11.2 Claims limitations

Claims having for object repair or replacement are the only allowable claims in case of the breaking of this guarantee. The MADE Company cannot be held responsible, whether on the basis of strict responsibility or any other legal basis, of any incidental or consecutive damage resulting from a violation of the guarantee or from carelessness.

12 COPYRIGHT

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MADE declines all responsibility for mistakes or inaccuracies that the present document may contain.

13 APPENDIX

13.1 CE conformity

The Society :

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167, Impasse de la garrigue
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declares by this document that the product described in this manual, that is :

NADIR

conforms to the following directives CE , including all the applicable amendments :

Référence	Titre
73/23/CEE	Low Voltage Directive
89/336/CEE	Electromagnetic Compatibility Directive

and that the standards and/or technical specifications listed in this manual have been applied.

The designated product has been designed, manufactured and tested in the framework of a Quality Assurance System certified as conforming to the standard :

ISO 9001 : 2008

by the Association Française pour l'Assurance Qualité - AFAQ.

Certificat : QUAL / 2005 / 24473B
Du : 07 / 05 / 2009

D. SPADA
C.E.O.