



Connection of the soil moisture sensor MAS-1

Part nr.

Instruction for connection of the CO_2 sensor to the Greenspec AFP, AFP63 or AFP light.

Manufacturor: Decagon, USA

Name of unit: MAS-1 4-20 mA soil moisture sensor.

Application: measurement of soil moisture in peat, substrate, rockwool. Knowing and regulating the correct soil moisture is an important factor for optimal plant growth. The measurement is not easy, the principle of the MAS is to measure the dielectric constant between the 2 poles. This value is much higher for water as for air or dry soil, giving a sensitive signal. The head of the sensor contains a microprocessor, to convert the measurement to a mA output signal.

Connecting to:

Electrical connection to AFP, see below. For programming details see next page

Hardware Installation

It can be put in horizontal or vertical position without problems. The sensor is made of polymer: **do not use any force** but make a suitable hole to put it in the soil and fill that up. To remove, do **not** pull on the wire, but dig it out with care!

Maintenance:

None, but if you use it in very different media, adjusting the calibration factor will improve the results.

See the factors on the rear. Ask help at info@greenspec.nl to correct.

Watch out: this needs second order function in software!

Connection of the MAS-1:

Connect the red cable to the 15V supply and the black cable to the signal input. Set the dip switch to the 4-20 mA range. Do not connect the unshielded wire.









Program setting details:

t 1:AFP456 Climate:

Nr Prog In¢ 5

Hard Type 0:Ana Nr In Hard 5

Usage Type 0:Default

Usage para 0:Default

Calc. Shift 0.0000

NrEvent Mi 0

NrEvent M: 0

Meas. Metr 2: Average Meas. Peric 00:01:00

soil moist

-25.0 162.5

4095

0.0000

AFP

Name

Min

Max.

CODAGE

In Calb

Go to AFP config, set the correct hardware inpunt number, select analog, usage at default. Give a name.

Then click on the left top symbol and you reach the calibration secti-

1: Go to the bottom section, set 4-20 equivalent to 0 to 100.

Click on calculate and you see the theoretical range.

2: Click on apply and you will see this also in the calibrate with 2 point section.

3: Set the name on soil moisture and click on Apply

4 After you close you will also read this range in the input settings setting (see left).

Then save the settings by clicking on the green confirm sign. After that close the window by clicking on

AFP Analog Input 0 Input N Select a Type to	Calibration lo Destination Input N Set Defau	ame soil mois	t le Input Pa	3 ameters		4	Apply
Select a Type to Auto set input t	o Set Defau :ype : Ec ar	lt value on th nd pH Grensp	ie Input Pa iec, Tempe	ameters ature/Humu	idity TH100	, Radiati	on CR100, E
			<u> </u>	Apply			
Calibration with :	2 points		Point 1	Point 2			
Calbration with :	2 points		Point 1	Point 2			
Calibration with :	2 points		Point 1 0	Point 2 10	Calculate		Apply
Calbration with :	2 points	RealTime	Point 1 0 Save PointXY1	Point 2 10 Save PointXY2	Calculate To Modify	1	Apply
Calibration with : Min	2 points	RealTime	Point 1 0 Save PointXY1	Point 2 10 Save PointXY2	Calculate To Modify		Apply
Calibration with : Min Max	2 points 44 Actual -25.0 162.5	RealTime	Point 1 0 Save PointXY1	Point 2 10 Save PointXY2	Calculate To Modify		Apply
Calibration with : Min Max Calibration	2 points 4, Actual -25.0 162.5 0.0	RealTime	Point 1 0 Save PointXY1	Point 2 10 Save PointXY2	Calculate To Modify		Apply
Calbration with : Min Max Calbration Precision	2 points 44 Actual -25.0 162.5 0.0	RealTime	Point 1 0 Save PointXY1	Point 2 10 Save PointXY2	Calculate To Modify		Apply
Calbration with : Min Max Calbration Precision In. Val	2 points 44 Actual -25.0 162.5 0.0 3	RealTime	Point 1 0 Save PointXY1	Point 2 10 Save PointXY2	Calculate To Modify		Apply
Calbration with : Min Max Calbration Precision In, Val Calc. Val	2 points 4, Actual -25.0 162.5 0.0 3 -1243.7	RealTime	Point 1 0 Save PointXY1 9 -2.5	Point 2 10 Save PointXY2	(Calculate) To Modify		Apply
Calbration with : Min Max Calbration Precision In. Val Calc. Val	2 points 4 Actual -25.0 162.5 0.0 3 -1243.7	RealTime	Point 1 0 Save PointXY1 9 -2.5	Point 2 10 Save PointXY2	(Calculate) To Modify		Apply
Calbration with : Min Max Calibration Precision In. Val Calc. Val Calbration with :	2 points 4 Actual -25.0 162.5 0.0 3 -1243.7 theorical cal	RealTime 2 -837.5 culation, Use	Point 1 0 Save PointXY1 9 -2.5 d Only for :	Point 2 10 Save PointXY2 (0/20mA, 4	(Calculate) To Modify /20ma,5/25	imA)	Apply
Calbration with 1 Min Max Calbration Precision In. Val Calc. Val Calbration with 1	2 points 4 Actual -25.0 162.5 0.0 3 -1243.7 theorical cal Measure	RealTime 2 -837.5 culation. User Rani Value Ra	Point 1 0 Save PointXY1 9 -2.5 d Only for : ange (ex. 1	Point 2 10 Save PointXY2 (0/20mA, 4 /10 Theo. 1	[Calculate] To Modify /20mA,5/25 alc.	imA)	Apply
Calbration with : Min Max Calbration Precision In. Val Calcration with Calbration with Min	2 points 4 4 4 4 4 2 5 0 1 62.5 0.0 3 -1243.7 theorical cal Measure 4.0	RealTime 2 -037.5 culation. Use Rani Value Ra	Point 1 0 Save PointXY1 9 -2.5 d Only for : ange (ex. 1	Point 2 10 Save PointXY2 (0/20mA, 4 /10 Theo 25.0	(Calculate) To Modify /20mA,5/25 Calc.	imA) 1	Apply

facturor data sheet	
Soil moisture measure sensor	MAS-1 from Decagon.com
General data	Size lxbxh: 8.9 cm x 1.8 cm x 0.7 cm Weight 50 g
Mechanical construction	Electronic platine on a Cable: 5 m (standard), 3 wire (22 AWG tinned Red and Black wires, 24 AWG tinned bare wire)
Input parameters	4-20 mA corresponds to 0-100% soil humidity
Output parameters	Response time 4 s ±6% VWC with preset calibration for supported growing media up to 65% VWC Calibration factor for mineral soil: V W C = 0.00328 xmA2 – 0.0244 x mA – 0.00565 Calibration factor for rock wool: V W C = 0.00446 x mA2 – 0.0359 x mA + 0.0741 Calibration factor for peat:
Electrical connection data	Supply 15V Consumption
Ambient conditions	Temperature-40 to 60 C Application of Council Directive: 2004/208/EC and 2011/65/EU Standards to which conformity EN61326- 1:2013 is declared: EN62321:2009
Electrical connection data Ambient conditions	 46% VWC with preset calibration for supported grown media up to 65% VWC Calibration factor for mineral soil: V W C = 0.00328 xmA2 – 0.0244 x mA – 0.00565 Calibration factor for rock wool: V W C = 0.00446 x mA2 – 0.0359 x mA + 0.0741 Calibration factor for peat: Supply 15V Consumption Temperature-40 to 60 C Application of Council Directive: 2004/208/EC and 2011/65/EU Standards to which conformity EN61326-1:2013 is declared: EN62321:2009

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Horticulture automation Groningen, The Netherlands www.greenspec.nl / info@greenspec.nl

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