AmsSense

Description

The AmsSense module is a client interface module in the Amplex Module System. The module offers a number of different interface options especially for substation equipment like temperature sensors, relays and meters.
Two PT100 3-wire temperature sensors can be directly connected to the module and the module features two digital inputs and two analog inputs for monitoring purposes. The two digital inputs can also be configured as open-collector outputs for control of external equipment, e.g. relays.
AmsSense can also be used for establishing two-way communication with RS485 compatible utility meters like DLMS meters or industrial monitoring devices running for example Modbus. The AmsSense module can easily be connected with up to ten child devices.
The AmsSense module collects data from the connected devices and subsequently transfers these data to an AmsCPU module that acts as a data concentrator and WAN module. The AmsCPU module delivers the data to the central server when required. Direct communication and power supply between the AmsSense module and the AmsCPU module are handled by an incorporated A-Bus interface, which is based on the industrially proven RS-485 technology.

Functionality

Topic	Comments
A-Bus communication	A-Bus two-way communication with A-Bus masters, e.g. AmsCPU, AmsCPU-IO.
RS485 communication	According to ANSI TIA/EIA-485-A, half duplex The module supports the following protocols: General purpose serial communication, dlms mode C, dlms/COSEM (HDLC), Modbus. For a complete list of all supported meter types, please contact Amplex A/S.
Autodiscovery	The module is automatically discovered by the AmsCPU. In case a module is disconnected from the AmsCPU, this is reported to the server application and the module is listed as missing. If the module is reconnected to the AmsCPU or another AmsCPU, it will be rediscovered by the system.
Real-time clock	The real-time clock is automatically synchronized with the AmsCPU, which in turn is synchronized with the Network Time Protocol (NTP).
LED	AMS Status LED (orange): indicates whether the A-Bus is up and running. RS485 Data LED (orange): indicates data traffic on RS485.

Reliability & Maintainability

Topic	Comments
Software upgrade	The software on the AmsSense module can be updated remotely from the central server.
Installation of new software	New software is transferred without interrupting the normal functionality of the AmsSense module. When the software has been transferred, the integrity of the software is checked and the software is installed.
Self-test	A built-in self-test (BIST) is performed after power-up.
Watchdog and brown-out reset	Watchdog and brown-out reset ensure that the system is up and running at all times.

Technical Specifications

Operational specifications

Storage temp.	-40°C to +85°C
Operating temp.	-20°C to +65°C
Max humidity	90% (non-condensing)
IP grade	IP20
Input voltage	12 V DC via A-Bus
Current consumption	Typical 30 mA, Max 50 mA

Standards and approvals

2006/95/EC, Low Voltage Directive (LVD)

2004/108/EC, EMC Directive

2002/95/EC, RoHS Directive

RoHS CE

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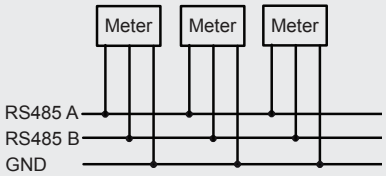
Connections

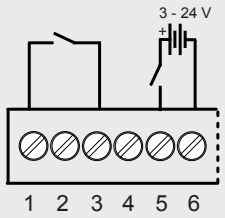
I/0	Comments
A-Bus	A-Bus client module
Service port	For use with Amplex service tools.
RS485	RS485 A and RS485 B connect to one meter or a collection of meters. A = inverting pin and B = non-inverting pin. The AmsSense module can be connected to a maximum of 10 meters. The AmsSense module has an internal termination resistor (120 Ohm) between RS485 A and RS485 B.
PT100 inputs	Two inputs for industrial standard PT100 temperature sensors that support 2-wire or 3-wire compensation. See I/O schematic, p. 3. Temperature range = -40°C to +150°C Accuracy = ± 1°C
Digital inputs	Two digital active-high inputs: Input/Output 1 and 2, see I/O schematic, p. 3. Input impedance = 110 Ohm (DC) Input voltage low = 0-1 V Input voltage high = 3-24 V When Input/Output 1 and 2 are used as digital inputs, connect an external switch (as illustrated from pin 1 to pin 3 in drawing 1) or use an external signal (as illustrated on pin 5 and 6 in drawing 1). AmsSense reads 0-1 V as logic 0/off and anything above 3 V as logic 1/on. The inputs are functional up to an input voltage of absolute max 30 V.
Digital outputs	Two open-collector outputs for driving, e.g. relays, optocouplers, etc.: Input/Output 1 and 2, see I/O schematic, p. 3. Max current sink = 70 mA Max voltage = 30 V When Input/Output 1 and 2 are used as digital outputs, connect, e.g. external relays as illustrated in drawing 2. The voltage available for driving the external equipment on pin 1 is 12 V. Reverse diodes are internally mounted. If external equipment, e.g. relays are preferred with a higher coil voltage than 12 VDC, connect an external power supply of absolute max 30 V between pin1 and pin 2 as illustrated in drawing 3.
Analog inputs	Two analog inputs: Input 3 and 4, see I/O schematic, p. 3. Analog input 0-10 V, 4-20 mA (0-20 mA) Impedance = 510 Ohm (DC) Accuracy = ± 2% FSD Can also be used as digital input: Threshold of approximately 1 V Max input voltage = 12 V (12 VDC out on pin 1)

RS485 connection

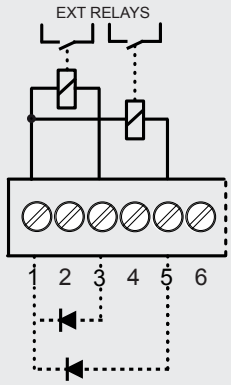


Input/Output connection

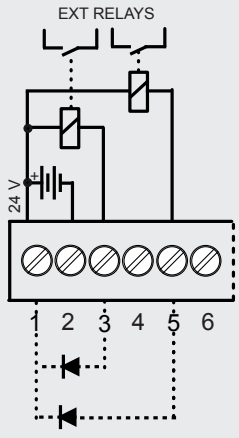
Drawing 1



Drawing 2



Drawing 3



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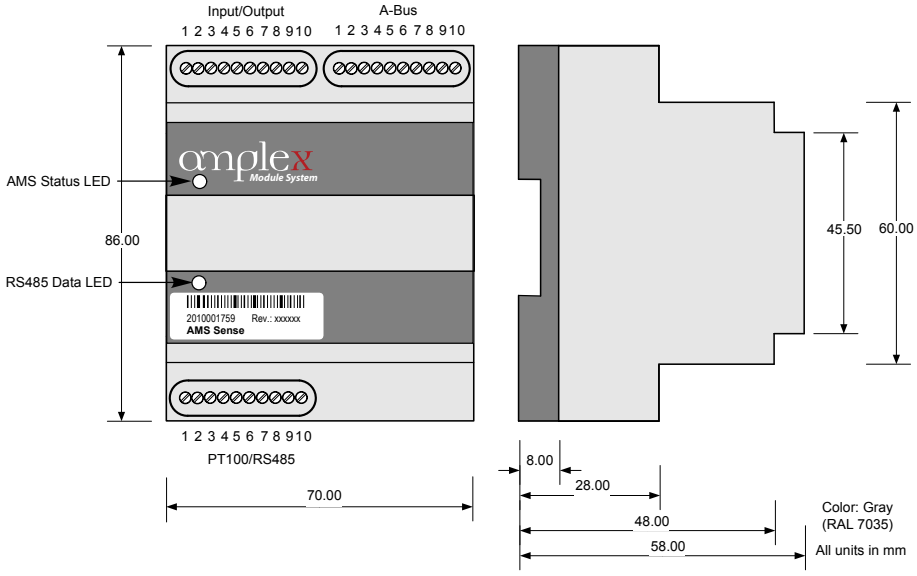
Installation Guide

The AmsSense module can be connected to any master module in the Amplex Module System, e.g. AmsCPU and AmsCPU-IO. The A-Bus connections are internally daisy-chained for easy installation.

Topic	Comments
A-Bus cable	Use shielded twisted pair cable.
A-Bus cable length	< 30 m
RS485 cable	Use twisted pair cable.
RS485 cable length	< 30 m
PT100 cable	It is recommended to use shielded cable in high-noise environments.
PT100 cable length	< 30 m
Input/Output cable length	< 3m
0.5 mm² terminals	Use a 2 mm slotted screwdriver to loosen/tighten the terminal screws.
Enclosure	The AmsSense module must be installed in an enclosure of protection degree IP65 or installed at a location that provides the module with the same level of protection.

Drawing



Ordering Information

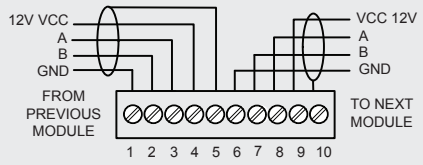
Product	Order number
AmsSense	100-30-013

Physical Specifications

Weight	85 g
Top part	Gray (RAL 7035)
	Lexan 940
Base part	Black (RAL 7021)
	Noryl VO 1550
Coating	Conformal coated
A-Bus connector	0.14 - 0.5 mm² (AWG 26-20)
PT100/RS485 con.	0.14 - 0.5 mm² (AWG 26-20)
Input/Output con.	0.14 - 0.5 mm² (AWG 26-20)
Mounting	DIN-rail (EN50022)

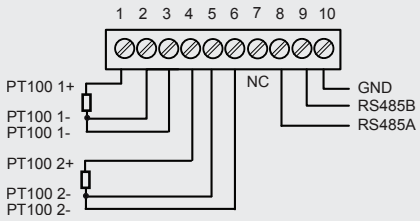
I/O Schematic

A-Bus connection



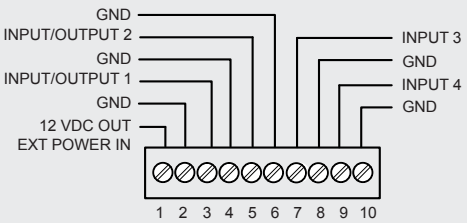
Terminals 0.5 mm²

PT100/RS485 connection



Terminals 0.5 mm²

Input/Output connection



Terminals 0.5 mm²

All specifications are subject to changes

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