Keywords: paper moisture meter, biofuel moisture meter, infrared moisture meter, industrial installations

How to Use the LAN232 Efficiently with Various Products

General

The accessory product LAN232 made by Visilab has more to offer than is first visible. The most important mode of use is to connect several sensors to it working as a transparent bridge between the PC master and the sensors. It has other uses too, like creating an RS232 connection with longer legs (40m) or as a RS485 local area network (LAN). The working principle is to pass all commands sent by the master to all slaves connected and to pass all responses received from the slaves to the master (but not to the other slaves). This makes the RS232 network to operate like a full duplex RS485 but being based on regular low cost RS232.

1. Using with Multiple Sensors

The first picture (Fig. 1) shows the LAN232 connected to several meters or sensors made by Visilab. The maximum number of sensors to be connected in this way is eight. They can be of any model as long as there is any sense in doing it. The big idea is to apply regular RS232 cables delivered with each sensor connecting to LAN232 just as if it would be a PC. This mode of use is most simple for the user. If longer legs are needed, the cables can be extended. Each sensor uses its own power supply. The regular serial cables are connected directly to LAN232's corresponding sockets if free ones are available. If all sockets are populated, use the split cables delivered with LAN232. Connect the combined end of each of them to LAN232 sockets and then the sensors' cables to the eight free ends. You can't miss this since the connector polarity is dictating your actions.

Note that each sensor in this network MUST have an address different from the other sensors. The available addresses are numbers from 1 to 255 and zero is reserved for the PC master. Overlapping addresses will cause muting of those sensors having the same address or strange data transmission errors or delays. Use the Network page's Explore action in the Advanced software to detect which slaves are found and working. You can actually send out some collective commands to all of them. Refer to each User's Guide for details on how to change the address in Keyboard mode. It is very simple. To communicate further with the same sensor with the PC program, you need to set the new primary slave address for the PC program. Else it will try to communicate with a nonexistent slave. The IRMA7Basic programs are not able to support more than one slave at a time but if this is sufficient, you can use either of them.

The high-speed option available in some sensors (115200 bauds) is available in LAN232 by turning the small switch to HIGH SPEED and turning the power OFF/ON again to make sure the unit reboots with the new setting. The speed has to be set to HIGH SPEED in each sensor to be attached to this network before that. Sensors which are not able to support HIGH SPEED are not allowed to be connected to this system. Another LAN232 should be purchased for them to build a NORMAL speed network. Refer to each User's Guide for details on how to switch to the HIGH SPEED operation. The default speed is NORMAL (9600 bauds) in all products unless informed otherwise in its documentation. Now we can deliver the TOP SPEED (115200 bauds) which is the curent standard in our meters. LAN232 can accept this too.

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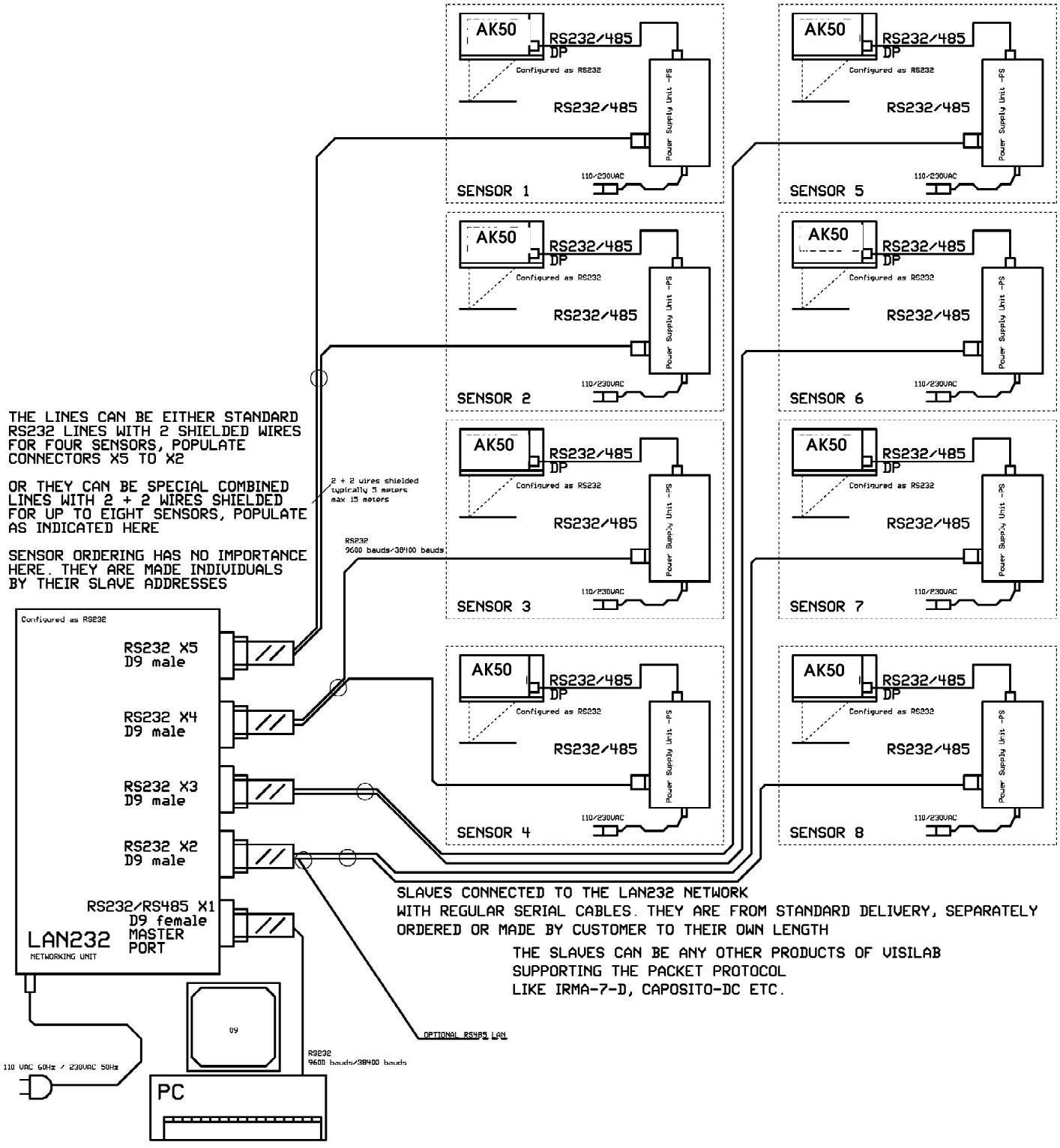

Figure 1. Using LAN232 with a group of sensors (maximum 8). Drawing is not to scale.

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2. Using with Longer Legs

The second picture (Fig. 2) shows the LAN232 connected to several meters or sensors made by Visilab. They can be of any model as long as there is any sense in doing it. The idea here is to apply very long (up to 40 meters) RS232 cables in each sensor connecting to LAN232 just as if it would be a PC. Each sensor uses its own power supply. Other issues are like in paragraph 1.

3. Using as a Long Distance Network, a Star Configuration

The third picture (Fig. 3) shows the LAN232 connected to several meters or sensors made by Visilab. They can be of any model. The idea is to build an RS485-based network with a simple twisted-pair cable going in a starlike formation from each sensor to the center where the LAN232 lies. Each sensor uses its own power supply and each one is configured for RS485 with its internal jumper plugs. LAN232 is also configured for RS485. This topology for the network is not recommended for very long distances (> 50meters) or in HIGH SPEED setting. The leg becomes even shorter if the TOP SPEED is used (< 5m). This is due to the fact that one can not terminate the cable impedance properly and signal reflections and interference may result. Use a shielded cable to avoids any interference from external devices. Other issues are like in paragraph 1.

4. Using as a Long Distance Network, a Linear Configuration

The fourth picture (Fig. 4) shows the LAN232 connected to several meters or sensors made by Visilab. They can be of any model. The idea is to build a RS485-based network with a simple twisted-pair cable going from one end of the system to the other end and the network ends at LAN232. It is located physically so that the whole network forms a long line. Each sensor uses its own power supply and each one is configured for RS485 with its internal jumper plugs. LAN232 is also configured for RS485. This topology is recommended over the former since the cable impedance can be terminated and reflections avoided is detected. The termination resistors are found in each sensor and also in LAN232. To terminate properly, turn on termination only at the two ends of the network, never in the intermediate cable part. The number of slaves can be much higher than eight which is handled by the Advanced program. You can select which ones are used in your program (Multiple slaves page). Use a shielded cable to avoids any interference from external devices. Other issues are like in paragraph 1.

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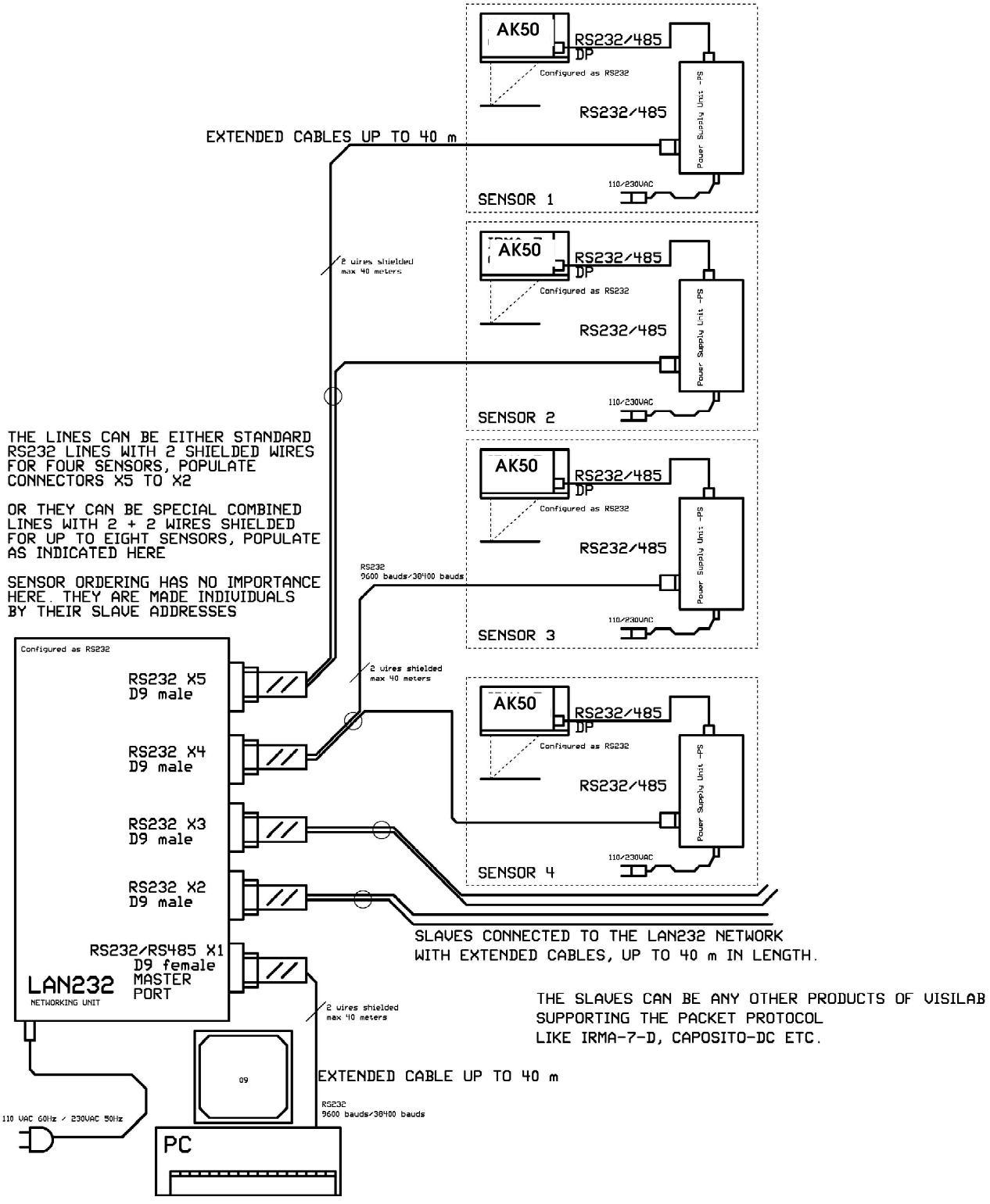

Figure 2. Using LAN232 with a group of sensors (maximum 8) having long legs, up to 40 meters. Drawing is not to scale.

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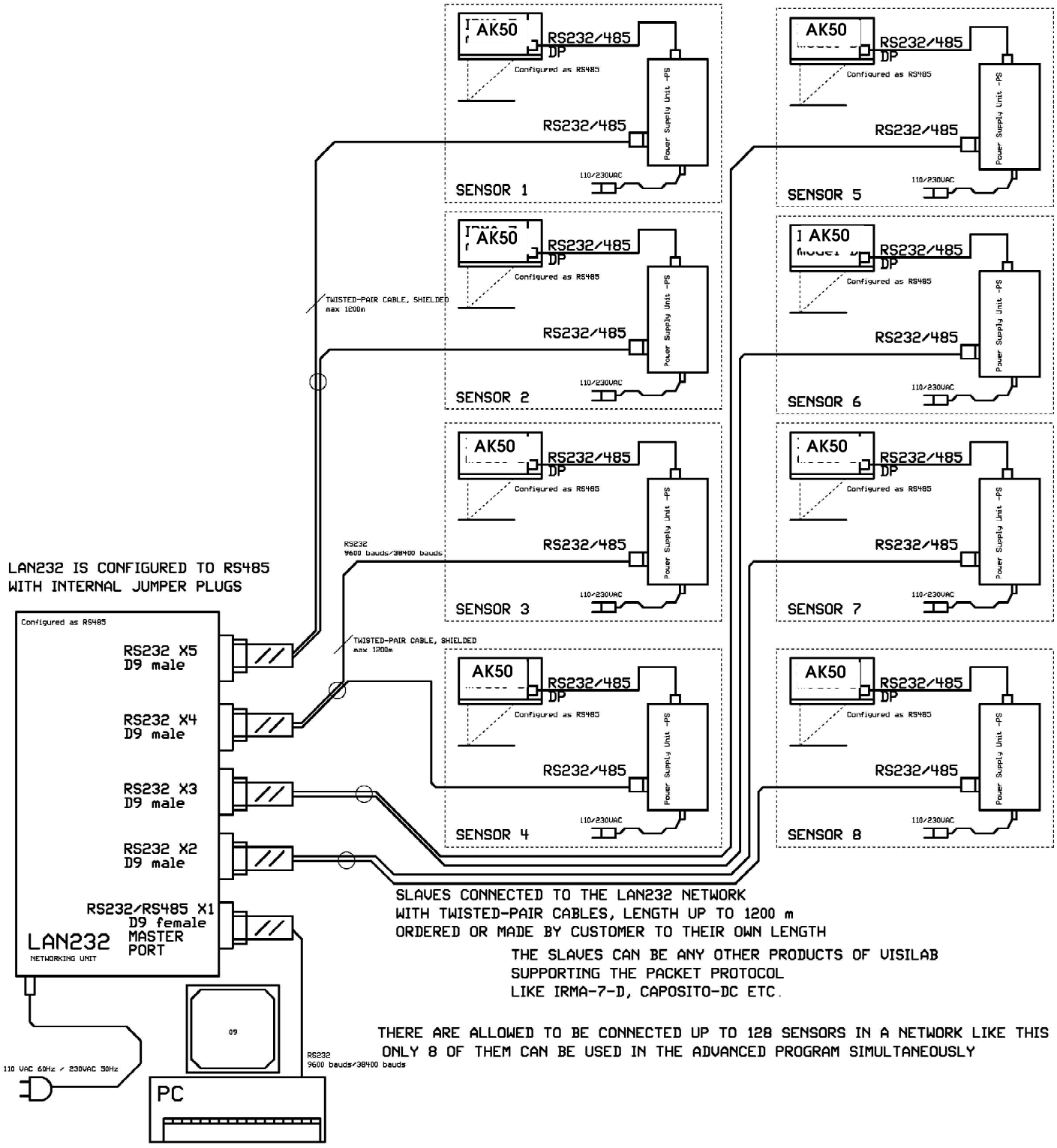

Figure 3. Using LAN232 with a group of sensors (maximum 8) in a long-distance local-area network (LAN) using RS485 physical hardware. Drawing is not to scale. This is a star configuration which is not suitable for high speeds when really long legs are in use.

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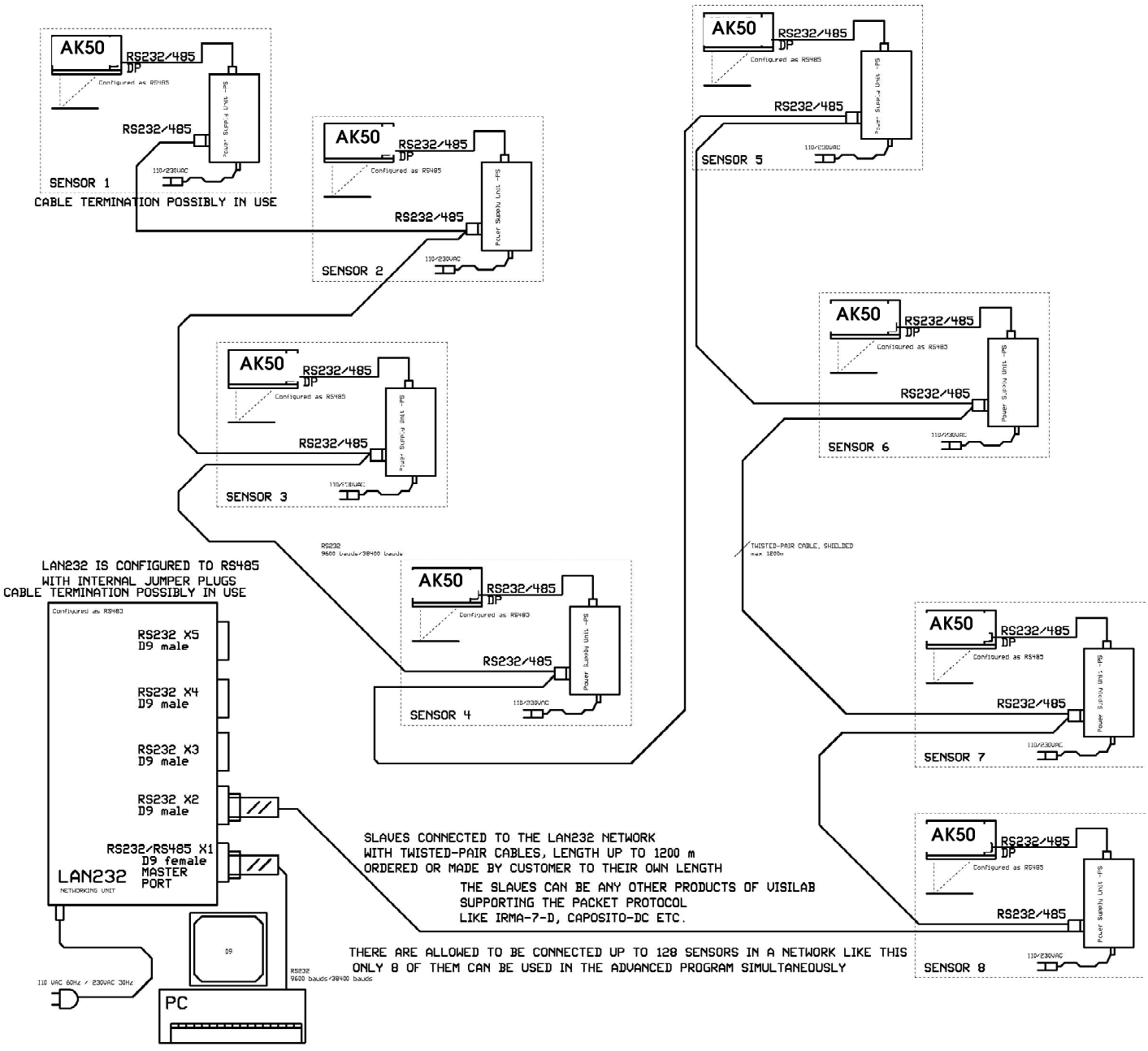

Figure 4. Using LAN232 with a group of sensors (maximum 8) in a long-distance local-area network (LAN) using RS485 physical hardware. Drawing is not to scale. This is a long-wire configuration which is recommended for high speeds when really long legs are in use. Use termination plugs at each end.

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