# M717 Quick Installation Guide

Warning!

Do not open the unit, except if so instructed by the Metrilog technical personnel! Should it be necessary to open the unit (e.g., to replace the SIM card), the operation MUST be executed only in a moisture free environment. You will need a Philips screwdriver size PH2. Note that the screws remain attached to the lid, there is no need to remove them. Remove the lid slowly and carefully, because an antenna is fixed on its back. The antenna cable goes to a connector on the electronics board. Before mounting the lid back, make sure the gasket is properly seated!

Please make sure that all the cables and connectors are properly fasten to avoid moisture entering the unit and/or the connectors. During normal use outdoors, the dust cover attached to the unit MUST always be inserted into the USB connector (see figure below). In addition, if one of the M12 connectors is not used, it must be covered with the attached protection cap.

About the M717 RTU

The M717 RTU (Remote Terminal Unit) is compatible with many types of sensors and data loggers. The data collected is internally stored and transmitted at regular, programmable intervals to the Cloud using the cellular networks. The RTU has two M12 connectors named SDI (4-pin) and MPI "Multi Protocol Interface" (8-pin). Following modes are available:

- SDI connector: SDI-12 native, RS-485 half-duplex and CAN
- MPI connector: RS-232, RS-422 full-duplex and RS-485 half-duplex

SDI connector   MPI connector   Micro-AB USB connector with dust cover inserted
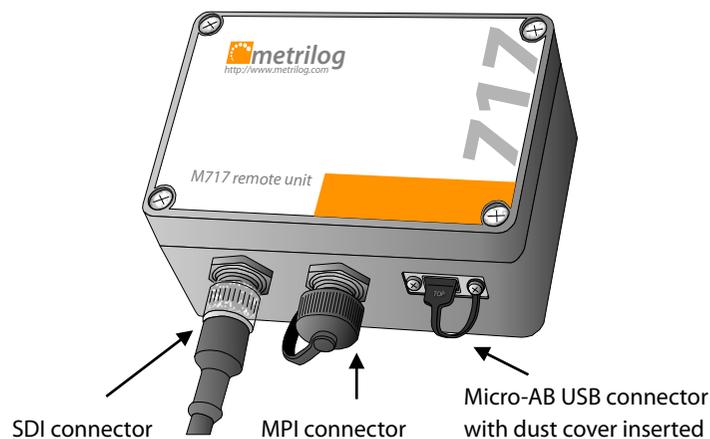
The mode selection for both interfaces is done through the software.

A micro-AB USB connector is also available for service. The unit may be powered through the USB connector from a PC. You do not have to use this connector, unless instructed by a Metrilog support technician.

The M717 RTU can service both interfaces at the same time. For instance, several SDI-12 compatible sensors can be attached to the SDI connector, while a Thies DL16 Data Logger is attached to the MPI connector.

SDI-12 Sensors

The M717 RTU supports the SDI-12 specification 1.3. For more details on the SDI-12 specification, please consult the documents at http://www.sdi-12.org. The SDI interface uses a four-wire cable carrying the SDI-12 bus signals and the power (typically 12 volt). The M717 RTU supports also the SDI-12 protocol over RS-485 levels, but this can be used only if all devices on the bus support this feature. The switch from SDI-12 native to RS-485 is done automatically if the RS-485 line A is also used. Otherwise leave the blue wire (pin 3) unconnected for SDI-12 native mode. The pin-out of the SDI connector is given below.
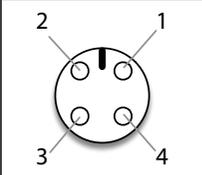
1	Brown	+ Vin (6 to 30 Volt)
2	White	- Vin and SDI-12 GND
3	Blue	RS-485 A/CAN-L (unused in native SDI-12 mode)
4	Black	SDI-12/RS-485 B/CAN-H

Thies Data Loggers Models TDL14 and DL16

Caution: do not perform the connections to the data logger while the cable to the M717 RTU is attached to the MPI connector and the logger is powered!

The Thies data loggers implement a proprietary serial protocol. The TDL14 logger supports the RS-232 and RS-485 full duplex modes, while the DL16 logger additionally supports the RS-485 half-duplex mode. The communication with the loggers is done using a 10 m cable attached to the MPI connector.

You must open the data logger and insert the cable through a free cable gland. Attach the cable wires to the corresponding screw posts as shown in the table below, depending on the selected serial mode (RS-232, RS-422 or RS-485) and logger type. The M717 RTU must be accordingly configured by setting the attribute *mpiMode* either to RS-232, RS-422 or RS-485.

The baud rate must conform to the setting of the data logger (usually 9600 baud; DL16 can be easily switched to 19200 in the field, which is the default baud rate for the M717 RTU). This can be set on the Metrilog M2M Gateway by means of the *mpiBaudRate* attribute.

M717 Pin-out			TDL14		DL16		
			RS-232	RS-422	RS-232	RS-422	RS-485
1	White		6 (GND)	6 (GND)	1 (GND)	1 (GND)	1 (GND)
2	Brown		5 (+12V)	5 (+12V)	7 (+12V)	7 (+12V)	7 (+12V)
3	Green		11 (TxD)	12 (TxD+)	6 (TxD)	5 (TxD+)	N.C.
4	Yellow		9 (RxD)	10 (RxD-)	2 (RxD)	3 (RxD-)	6 (B)
5	Grey		11 (TxD)	14 (TxD-)	N.C.	6 (TxD-)	N.C.
6	Pink		13 (GND)	13 (GND)	4 (GND)	4 (GND)	4 (GND)
7	Blue		N.C.	8 (RxD+)	N.C.	2 (RxD+)	5 (A)
8	Red		N.C.	N.C.	N.C.	N.C.	N.C.
Shield			Connect to metal housing				
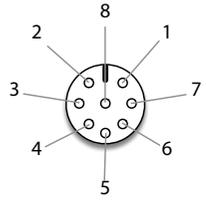
If required, in RS-422 or RS-485 modes, 120Ω termination resistors can be activated on the M717 RTU side. This can be done by setting the attribute *mpiTermination* to true. For more details on these and many other settings, see the M717 User Guide on Metrilog's web site.

Note: all the wires marked in the table as "N.C." must be left unconnected and insulated from other wires and/or metallic parts.

Davis Vantage Pro 2 Console

The M717 RTU can be connected to a Vantage Pro 2 weather station manufactured by Davis Instruments. The M717 RTU can be installed both indoors and outdoors, but the required M905 Connexion Box (sold as separate option), as well as the mains adapter cannot be installed outdoors. The cable from the Connection Box must be attached to the MPI connector. The drawing on the right side shows the complete setup.

M717 RTU Mechanical Installation

The M717 RTU unit should be mounted outdoors on a mast by means of the optional mounting fixture and the hose clamp, in a vertical position so that the connectors are always underside facing the ground (see figure below). Any other fixture can be used, if two 6,5 mm

mounting holes distanced 92 mm apart are provided. Use the two M6 screws and spring washers to mount the unit onto the fixture. The two holes on the lower side of the M717 RTU provide an M6 thread.

It is recommended to place the top of the M717 RTU (where the built in antennas reside) as far as possible from metallic objects, in particular from the mast itself. Ideally, the unit should be mounted on the very top of the mast. Use tie wraps to fasten the cables to the mast after the mechanical installation is completed.
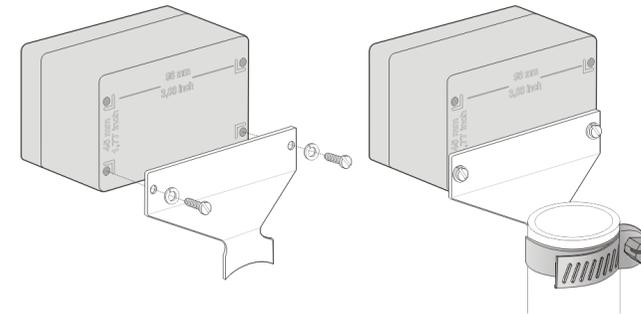
Power Supply Requirements

The M717 RTU can be powered either over the SDI, or the MPI interfaces from any 6 to 30 V power source delivering 6 W or more. At 12 V in sleep mode, the unit draws about 3 mA on average, while in deep sleep mode max. 1 mA. In service mode, the unit can be also powered over the USB interface.