

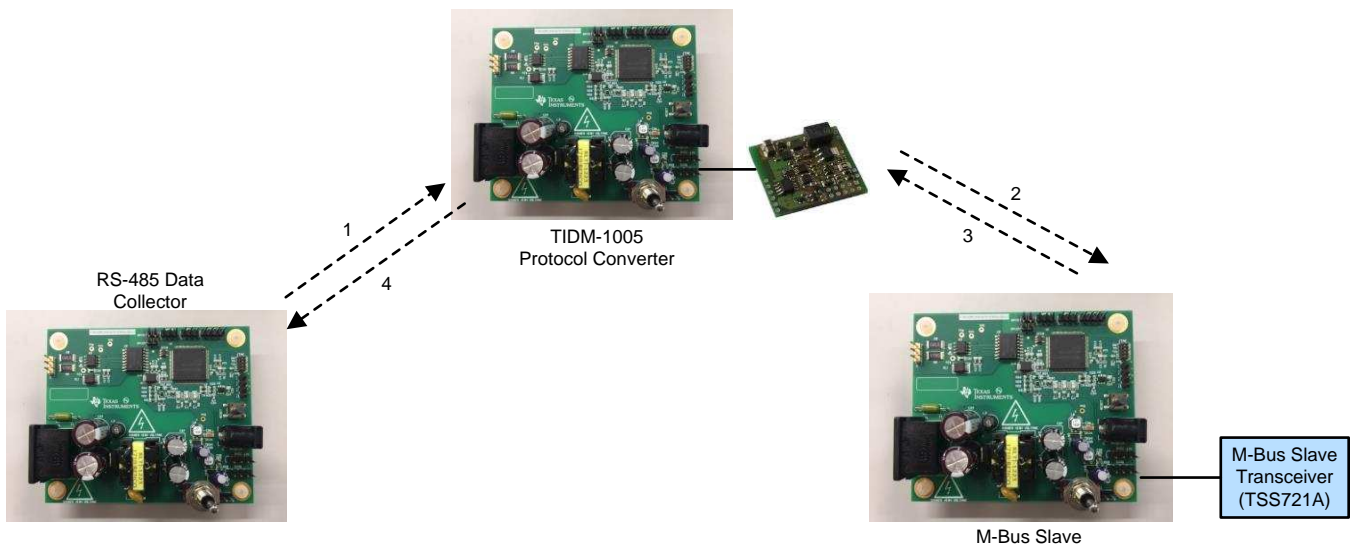
3.2 Testing and Results

3.2.1 Test Setup and 3-Node Demonstration

Figure 23 shows the 3-node setup for testing and demonstration. The setup consists of RS-485 data collector, TIDM-1005 protocol converter connected with external M-Bus master module, and M-Bus slave with external M-Bus slave modem. In the setup the RS-485 data collector installs RS-485 communication only. The TIDM-1005 protocol converter acts as a mini data collector to interconnect between the RS-485 data collector and M-Bus slave node by using RS-485 (for the RS-485 data collector) and M-Bus (for M-Bus slave).

The demonstration with the prebuilt binaries runs in the following sequences:

1. The RS-485 data collector triggers 10B meter reading request message to the TIDM-1005 protocol converter from RS-485. In this example, the data collector trigger the 10B message every 5 seconds.
2. The TIDM-1005 protocol converter processes the request message and sends out REQ_UD2 frame (request for Class 2 Data) to M-Bus slave from M-Bus.
3. The M-Bus slave responds back to the TIDM-1005 protocol converter with RSP_UD message from M-Bus. The RSP_UD payload size varies. In this example for every transmission, the payload size increases by 1 B, starting from 1B (minimum) to 255B (maximum).
4. The TIDM-1005 protocol converter processes the RSP_UD message, converts payload into the RS-485 format, and delivers to RS-485 data collector through RS-485.



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Figure 23. 3-Node Test Setup

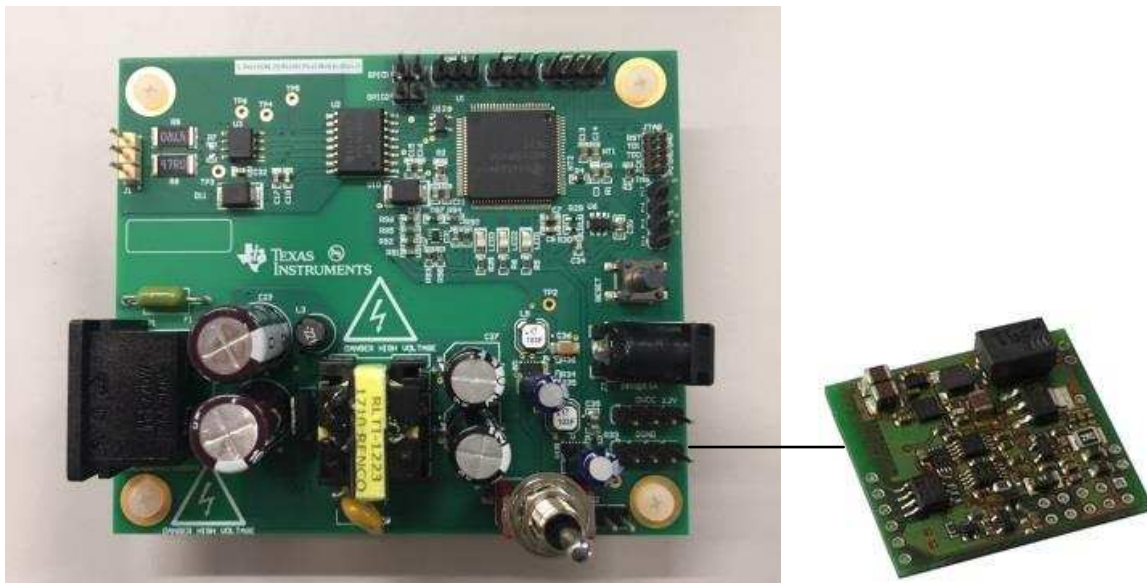
Table 2 summarizes the binary to be flashed on each of board for the demonstration setup.

Table 2. Demonstration Software Setup

BOARD	BINARY TO BE FLASHED
RS-485 data collector	RS485_MBus_Protocol_Converter_rs485_data_collector.out
TIDM-1005 protocol converter	RS485_MBus_Protocol_Converter_protocol_converter.out
M-Bus slave	RS485_MBus_Protocol_Converter_mbus_slave.out

Because the RS-485 data collector only uses RS-485 and the TIDM-1005 EVM includes the complete path for RS-485, no external module is necessary to set up the RS-485 data collector.

The protocol converter acts as a M-Bus master and thus requires an external M-Bus master module as shown in Figure 24. For the 3-node setup, [Solvimus M-Bus Master module](#) was used for the external M-Bus master module. The power supply module in the TIDM-1005 EVM is designed to provide sufficient power for the external M-Bus master to support more than 100 M-Bus slave nodes. In addition, the software example is not limited to support the maximum number of M-Bus slave nodes. Depending on the external M-Bus master module specification, further limitation can be applied on the number of M-Bus slave nodes to be supported.



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Figure 24. TIDM-1005 Protocol Converter With External M-Bus Master Module (Protocol Converter)

Figure 25 shows the details on pin connections between TIDM-1005 and the external M-Bus master module.

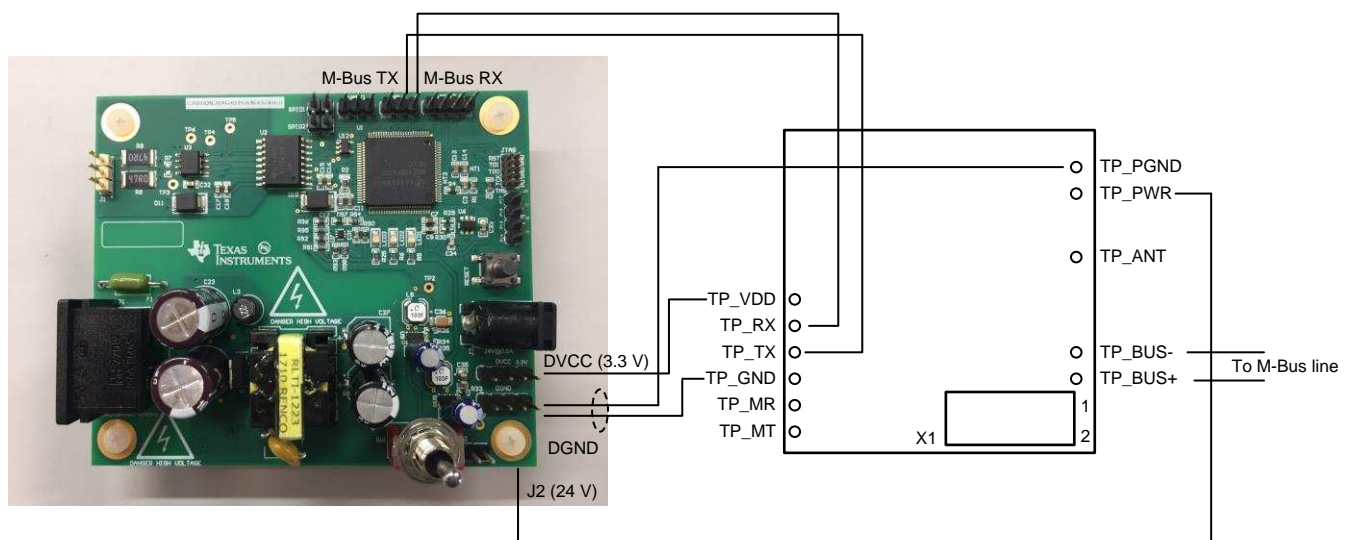


Figure 25. Pin Connection Between TIDM-1005 and M-Bus Master Module

The M-Bus slave node is built with TIDM-1005 board and M-Bus slave module.