

# Uponor Smatrix Move PRO Controller X-159 Modbus RTU interface

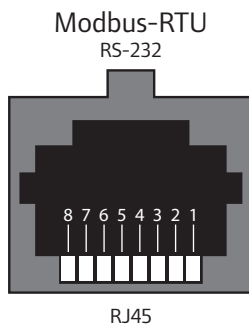
## PRODUCT INFORMATION



The controller can be connected and integrated to a building management system (BMS) through a Modbus-RTU interface over RS-232.

### Connector pins

The illustration below shows the pinout of the RJ45 connector on the controller.



Pin:

1. Data transmission (Tx) to system master
2. Ground
3. Data reception (Rx) from system master
4. Ground
5. Ground
6. +5 V DC output
7. Ground
8. Ground

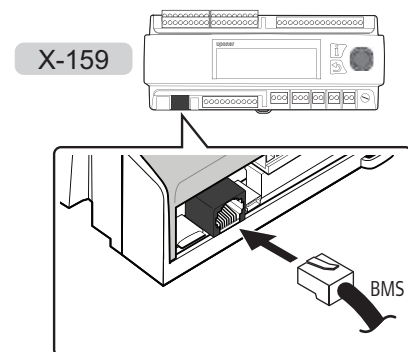
### RS-232 settings

Configure the RS-232 interface as follows:

- Baudrate: 19200 bps
- Data bits: 8
- Stop bits: 1
- Parity bit: No
- Flow control: No

### Connecting the BMS cable

The illustration below shows how to connect a BMS to the Modbus RTU interface on the controller.



### WARNING!

Electrical installation and service behind secured 230 V AC covers must be carried out under the supervision of a qualified electrician.

To connect a BMS to the controller:

1. Ensure that the power is disconnected from the controller.
2. Study the wiring diagrams of the controller to locate the connector position.
3. Connect the BMS cable to the Move PRO controller using a RJ-45 contact.

*See separate documentation for more information about BMS integration.*

## Supported Modbus-RTU functions

The Move PRO controller supports the following functions for Modbus-RTU communication.

Description	Function code (hex)
Read Holding Registers	03
Write Single Register	06
Write Multiple Registers	10

- Analogue variables are coded with 32 bits mapped into 2 holding registers (read only variables also).
- Binary variables are coded with 16 bits mapped into 1 holding register (read only variables also).

The most significant byte is sent first.

01 (hex) is always used by the Move PRO controller always as the slave device address.

### FRAME FORMAT: READ HOLDING REGISTERS

Request (Analogue/binary variables)				
Slave Address (01h)	Function code (03h)	Starting register address	Amount of registers (0002h/0001h)	CRC
1 byte	1 byte	2 bytes	2 bytes	2 bytes

Response (Analogue/binary variables)				
Slave Address (01h)	Function code (03h)	Byte count (04h/02h)	Read value (MSB first)	CRC
1 byte	1 byte	1 byte	4 bytes	2 bytes

Response in case of error			
Slave Address (01h)	Error code (83h)	Exception code	CRC
1 byte	1 byte	1 byte	2 bytes

### FRAME FORMAT: WRITE SINGLE REGISTER

Request				
Slave Address (01h)	Function code (06h)	Register address	Register value	CRC
1 byte	1 byte	2 bytes	2 bytes	2 bytes

Response				
Slave Address (01h)	Function code (06h)	Register address	Register value	CRC
1 byte	1 byte	2 bytes	2 bytes	2 bytes

Response in case of error			
Slave Address (01h)	Error code (86h)	Exception code	CRC
1 byte	1 byte	1 byte	2 bytes

### FRAME FORMAT: WRITE MULTIPLE REGISTERS

Request						
Slave Address (01h)	Function code (10h)	Starting register address	Amount of registers (N)	Byte count (2N)	Register value	CRC
1 byte	1 byte	2 bytes	2 bytes	1 byte	2N bytes	2 bytes

Request example (write to 1 Move PRO analogue variable)						
01h	10h	Variable address	0002h	04h	Value (MSB first)	CRC
1 byte	1 byte	2 bytes	2 bytes	1 byte	4 bytes	2 bytes

Response				
Slave Address (01h)	Function code (10h)	Starting register address	Amount of registers	CRC
1 byte	1 byte	2 bytes	2 bytes	2 bytes

Response example (write to 1 Move PRO analogue variable)				
01h	10h	Variable address	0002h	CRC
1 byte	1 byte	2 bytes	2 bytes	2 bytes

Response in case of error			
Slave Address (01h)	Error code (90h)	Exception code	CRC
1 byte	1 byte	1 byte	2 bytes

## Heating Application - Available variables

These variables are available when communicating with the Move PRO controller (with the heating application installed).

Display name – General	Register address (decimal)	Type	Analogue/ Binary	Coding
Outdoor Temperature	1578	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)

Display name – Zone 1	Register address (decimal)	Type	Analogue/ Binary	Coding
Supply temp.	1387	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Calculated supply temp.	318	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Heating curve > setting	1330	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0.1 – 1.6
Heating curve > offset	1338	Read/Write	Analogue	32 bit, Signed Integer. Range: -8 – +8
Max supply temp.	400	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 70
Min supply temp.	398	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 35
Mixing valve	242	Read	Analogue	32 bit, Signed Integer. Range: 0 – 100
Pump	254	Read	Binary	16 bit, Unsigned Integer (binary variable coded into 16 bit unsigned integer)
Indoor temperature	1362	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
ECO-Comf. status	13620	Read	Binary	16 bit, Unsigned Integer, ECO = 0; Comfort =1
Indoor setpoint	432	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 5 – 35
ECO setback	430	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0 – 10

Display name – Zone 2	Register address (decimal)	Type	Analogue/ Binary	Coding
Supply temp.	1389	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Calculated supply temp.	452	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Heating curve > setting	1332	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0.1 – 1.6
Heating curve > offset	1340	Read/Write	Analogue	32 bit, Signed Integer. Range: -8 – +8
Max supply temp.	694	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 70
Min supply temp.	692	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 35
Mixing valve	244	Read	Analogue	32 bit, Signed Integer. Range: 0 – 100
Pump	256	Read	Binary	16 bit, Unsigned Integer (binary variable coded into 16 bit unsigned integer)
Indoor temperature	1646	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
ECO-Comf. status	13982	Read	Binary	16 bit, Unsigned Integer, ECO = 0; Comfort =1
Indoor setpoint	495	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 5 – 35
ECO setback	497	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0 – 10
DHW - Circ return temp.	1233	Read	Analogue	32 bit, Signed Integer

Display name – Zone 3	Register address (decimal)	Type	Analogue/ Binary	Coding
Supply temp.	1393	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Calculated supply temp.	326	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Meltaway - Calculated supply temp.	1211	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Heating curve > setting	1334	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0.1 – 1.6
Heating curve > offset	1342	Read/Write	Analogue	32 bit, Signed Integer. Range: -8 – +8
Max supply temp.	512	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 70
Min supply temp.	510	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 35
Mixing valve	246	Read	Analogue	32 bit, Signed Integer. Range: 0 – 100
Pump	258	Read	Binary	16 bit, Unsigned Integer (binary variable coded into 16 bit unsigned integer)
Indoor temperature	1417	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
ECO-Comf. status	14344	Read	Binary	16 bit, Unsigned Integer, ECO = 0; Comfort =1
Indoor setpoint	499	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 5 – 35
ECO setback	501	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0 – 10
Meltaway - Return temp	384	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Meltaway - Ground temp	1419	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Meltaway - Ground moisture	771	Read	Binary	16 bit, Unsigned Integer, No = 0; Yes =1
Meltaway – Primary return temp	1401	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Meltaway - Status	618	Read	Analogue	32 bit, Signed, Stop = 0; Idle =1; Melting = 2; Protection = 3

Display name – Zone 4	Register address (decimal)	Type	Analogue/ Binary	Coding
Supply temp.	1423	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Calculated supply temp.	481	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Meltaway - Calculated supply temp.	1213	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Heating curve > setting	1336	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0.1 – 1.6
Heating curve > offset	1344	Read/Write	Analogue	32 bit, Signed Integer. Range: -8 – +8
Max supply temp.	1196	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 70
Min supply temp.	1194	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 35
Mixing valve	248	Read	Analogue	32 bit, Signed Integer. Range: 0 – 100
Pump	260	Read	Binary	16 bit, Unsigned Integer (binary variable coded into 16 bit unsigned integer)
Indoor temperature	1638	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
ECO-Comf. status	14706	Read	Binary	16 bit, Unsigned Integer, ECO = 0; Comfort =1
Indoor setpoint	600	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 5 – 35
ECO setback	602	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0 – 10
Meltaway - Return temp	388	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Meltaway - Ground temp	1640	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Meltaway - Ground Moisture	224	Read	Binary	16 bit, Unsigned Integer, No = 0; Yes =1
Meltaway – Primary return temp	1411	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Meltaway - Status	641	Read	Analogue	32 bit, Signed, Stop = 0; Idle =1; Melting = 2; Protection = 3

## Heating/Cooling Application - Available variables

These variables are available when communicating with the Move PRO controller (with the heating/cooling application installed).

Display name – General	Register address (decimal)	Type	Analogue/ Binary	Coding
Outdoor Temperature	1757	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)

Display name – Zone 1	Register address (decimal)	Type	Analogue/ Binary	Coding
Supply temp.	1413	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Heating - Calculated supply temp.	318	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Cooling - Calculated supply temp.	473	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Heating curve > setting	1330	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0.1 – 1.6
Heating curve > offset	1338	Read/Write	Analogue	32 bit, Signed Integer. Range: -8 – +8
Cooling curve > setting	1346	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0.1 – 1.6
Cooling curve > offset	1354	Read/Write	Analogue	32 bit, Signed Integer. Range: -8 – +8
Heating - Max supply temp.	400	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 70
Heating - Min supply temp.	398	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 35
Cooling - Max supply temp.	595	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 70
Cooling - Min supply temp.	593	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 35
Mixing valve	668	Read	Analogue	32 bit, Signed Integer. Range: 0 – 100
Pump	389	Read	Binary	16 bit, Unsigned Integer (binary variable coded into 16 bit unsigned integer)
Indoor temperature	1362	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
ECO-Comf. status	13620	Read	Binary	16 bit, Unsigned Integer, ECO = 0; Comfort =1
Indoor setpoint	432	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 5 – 35
ECO setback	430	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0 – 10

Display name – Zone 2	Register address (decimal)	Type	Analogue/ Binary	Coding
Supply temp.	1644	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Heating - Calculated supply temp.	452	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Cooling - Calculated supply temp.	1423	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Heating curve > setting	1332	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0.1 – 1.6
Heating curve > offset	1340	Read/Write	Analogue	32 bit, Signed Integer. Range: -8 – +8
Cooling curve > setting	1348	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0.1 – 1.6
Cooling curve > offset	1356	Read/Write	Analogue	32 bit, Signed Integer. Range: -8 – +8
Heating - Max supply temp.	694	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 70
Heating - Min supply temp.	692	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 35
Cooling - Max supply temp.	1546	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 70
Cooling - Min supply temp.	1544	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 35
Mixing valve	244	Read	Analogue	32 bit, Signed Integer. Range: 0 – 100
Pump	256	Read	Binary	16 bit, Unsigned Integer (binary variable coded into 16 bit unsigned integer)
Indoor temperature	1646	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
ECO-Comf. status	13982	Read	Binary	16 bit, Unsigned Integer, ECO = 0; Comfort =1
Indoor setpoint	495	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 5 – 35
ECO setback	497	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0 – 10
DHW - Circ return temp.	1379	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0 – 10

Display name – Zone 3	Register address (decimal)	Type	Analogue/ Binary	Coding
Supply temp.	1415	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Heating - Calculated supply temp.	326	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Cooling - Calculated supply temp.	1450	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Meltaway - Calculated supply temp.	1211	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Heating curve > setting	1334	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0.1 – 1.6
Heating curve > offset	1342	Read/Write	Analogue	32 bit, Signed Integer. Range: -8 – +8
Cooling curve > setting	1350	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0.1 – 1.6
Cooling curve > offset	1358	Read/Write	Analogue	32 bit, Signed Integer. Range: -8 – +8
Heating - Max supply temp.	512	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 70
Heating - Min supply temp.	510	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 35
Cooling - Max supply temp.	1613	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 70
Cooling - Min supply temp.	1611	Read/Write	Analogue	32 bit, Signed Integer. Range: 5 – 35
Mixing valve	1190	Read	Analogue	32 bit, Signed Integer. Range: 0 – 100
Pump	1187	Read	Binary	16 bit, Unsigned Integer (binary variable coded into 16 bit unsigned integer)
Indoor temperature	1417	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
ECO-Comf. status	14344	Read	Binary	16 bit, Unsigned Integer, ECO = 0; Comfort =1
Indoor setpoint	499	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 5 – 35
ECO setback	501	Read/Write	Analogue	32 bit, Signed, 1 decimal (multiplied by 10). Range: 0 – 10
Meltaway - Return temp	384	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Meltaway - Ground temp	1419	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Meltaway - Ground moisture	771	Read	Binary	16 bit, Unsigned Integer, No = 0; Yes =1
Meltaway - Primary return temp	1411	Read	Analogue	32 bit, Signed, 1 decimal (multiplied by 10)
Meltaway - Status	618	Read	Analogue	32 bit, Signed, Stop = 0; Idle =1; Melting = 2; Protection = 3



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