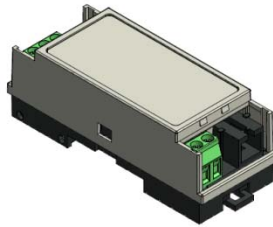


LMV3 Series

OCI413.20

for use with LMV3... Linkageless Burner Management Systems



OCI413.20

Description

The OCI413.20 provides the LMV3... family of flame controllers with a Modbus RTU or BACnet MS/TP interface. This allows the interconnection of one or more LMV3... to a PLC or building management system (BMS).

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Compatible Controls

Linkageless Burner Management Systems

- LMV36...
- LMV37...

Physical Connections

Power

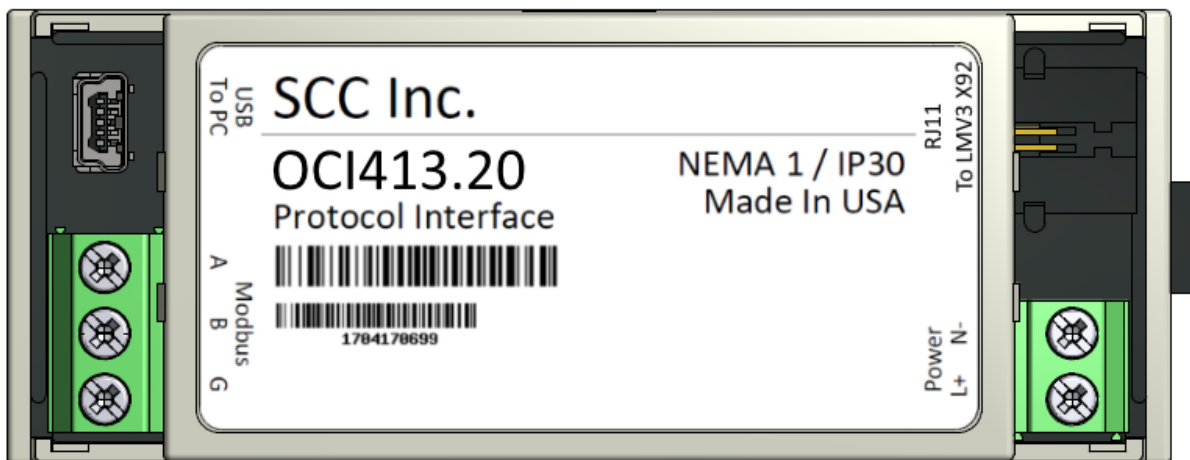
Power to the OCI413.20 must be either 9-24VDC or 9-24VAC (nominal). Power consumption is 2.5W or less. **SCC part number AGA15-24** is available as a suitable power supply.

Terminal designations:

Label	Function
L+	DC + / AC ~
N-	DC - / AC ~

Connection to LMV3...

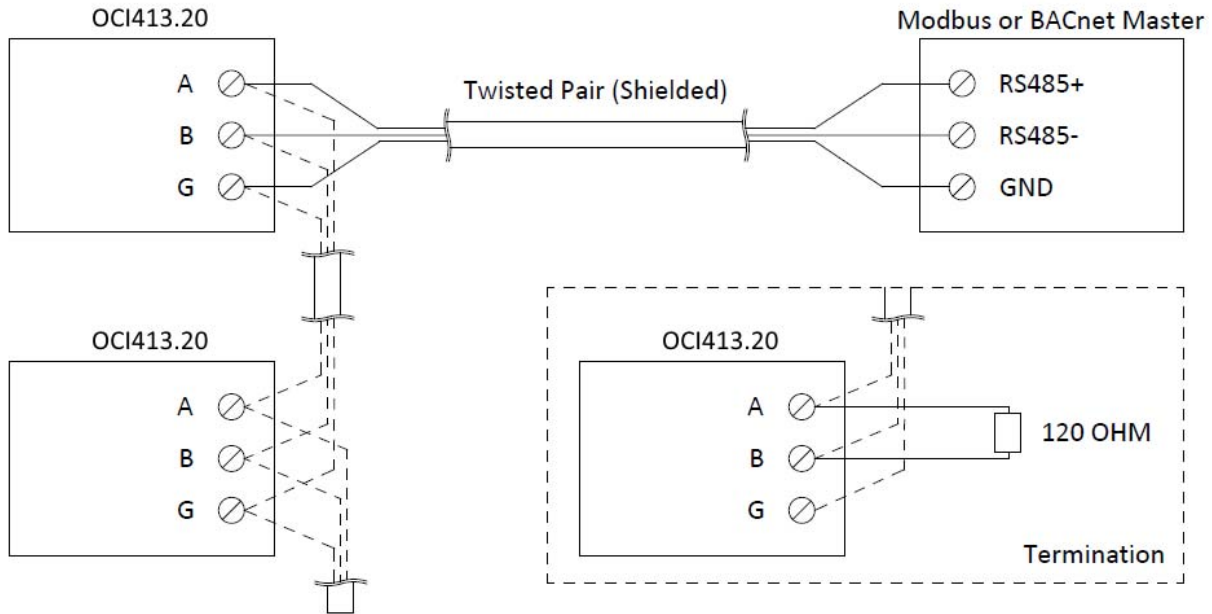
The connection from the OCI413.20 to the LMV3... should be made with the supplied cable. The connection at the LMV3... is to the X92 port. **Maximum allowed cable length is 3 meters.**



Physical Connections (continued)

Connection to BMS

The connection from the BMS to the OCI413.20 is via terminal block. The physical medium is RS-485. Multiple RS-485 nodes may be connected in a daisy-chain. For long runs (typically greater than 1000 feet) or noisy environments, termination may be required on the end node.



Terminal designations:

Label	Function
A	RS-485 Data (+)
B	RS-485 Data (-)
G	RS-485 Common Ground

Status LED

The status LED annunciates the status of the OCI413.20 and the connection to the LMV3...

Color	Status
Green Flashing	No Connection to LMV3...
Green / Red Alternating	Communicating with LMV3...
Red Flashing	Internal Error OCI413.20

Tx/Rx LED

The LED will flash red to indicate incoming communication on the RS-485 connection. The LED will flash green to indicate outgoing communication. With normal communication, the LED will rapidly alternate between green and red. NOTE: If the poll rate is fast the flashes may be very brief and hard to notice.

Required LMV3 Configuration

The service (heating engineer) password must be entered for these parameters to be accessed. The default service password is 9876. If the password has been changed, please consult the equipment OEM for the correct password.

1. Hold down both the **F** and the **A** buttons until the display reads 'Code', followed by a string of seven underscores.
2. Use the **+** and **-** buttons to enter the password. Press **ENTER** (the button to the right of the display) after each entry, and again once the complete password is entered. If the password is incorrect, 'Error' will be displayed and the process will have to be restarted.
3. If the password is entered successfully, the screen will display 'Para' and then '400: Set' with the '400:' flashing.
4. Use the **-** button to navigate to '100: PArA', then press **ENTER**.
5. Use the **+** and **-** buttons to navigate to a flashing '141:'. If this value does not read '1', press **ENTER** and then use the **+** and **-** buttons to change it to '1', then press **ENTER** to confirm the change. This parameter activates Modbus. To return to the parameter navigation, press the **+** and **-** buttons simultaneously (**ESC**). The display should return to flashing '141:'. This procedure will be used to change all parameters.
6. Change '142:' to 120. This parameter sets the timeout.
7. Change '145:' to 1. This parameter sets the Modbus address.
8. Change '146:' to 1. This parameter sets the baud rate to 19200 bit/s.
9. Change '147:' to 0. This parameter sets the parity to none.
10. When all the parameters are entered, press **ESC** in two successions to back up to the main screen. The changes take effect immediately (no reboot required).

Modbus RTU Connection Details

Modbus RTU protocol selection and addressing is done using the PC tool **OCI Configuration Utility** (see next section).

Supported addresses: 1-247

Supported baud rates: 2400, 4800, 9600, 19200, 38400, 57600, and 115200

Supported data bits: 8

Supported parity and stop bits: none (1 or 2 stop bits), odd (1 stop bit), and even (1 stop bit)

Supported function codes: 3 (read holding registers), 4 (read input registers), 6 (write single holding register), and 16 (write multiple holding registers)

Maximum read length: 125 (if beginning and ending registers are valid addresses)

BACnet MS/TP Connection Details

BACnet MS/TP protocol selection and addressing is done using the PC tool **OCI Configuration Utility** (see next section).

Supported addresses: 0-127

Supported baud rates: 9600, 19200, 38400, 57600, 76800, and 115200

Supported data bits: 8

Supported parity and stop bits: none (1 stop bit)

Supported device instances: 0-4194302

Configuration Utility

Using the Configuration Utility

1. Double-click the icon to open the configuration utility.

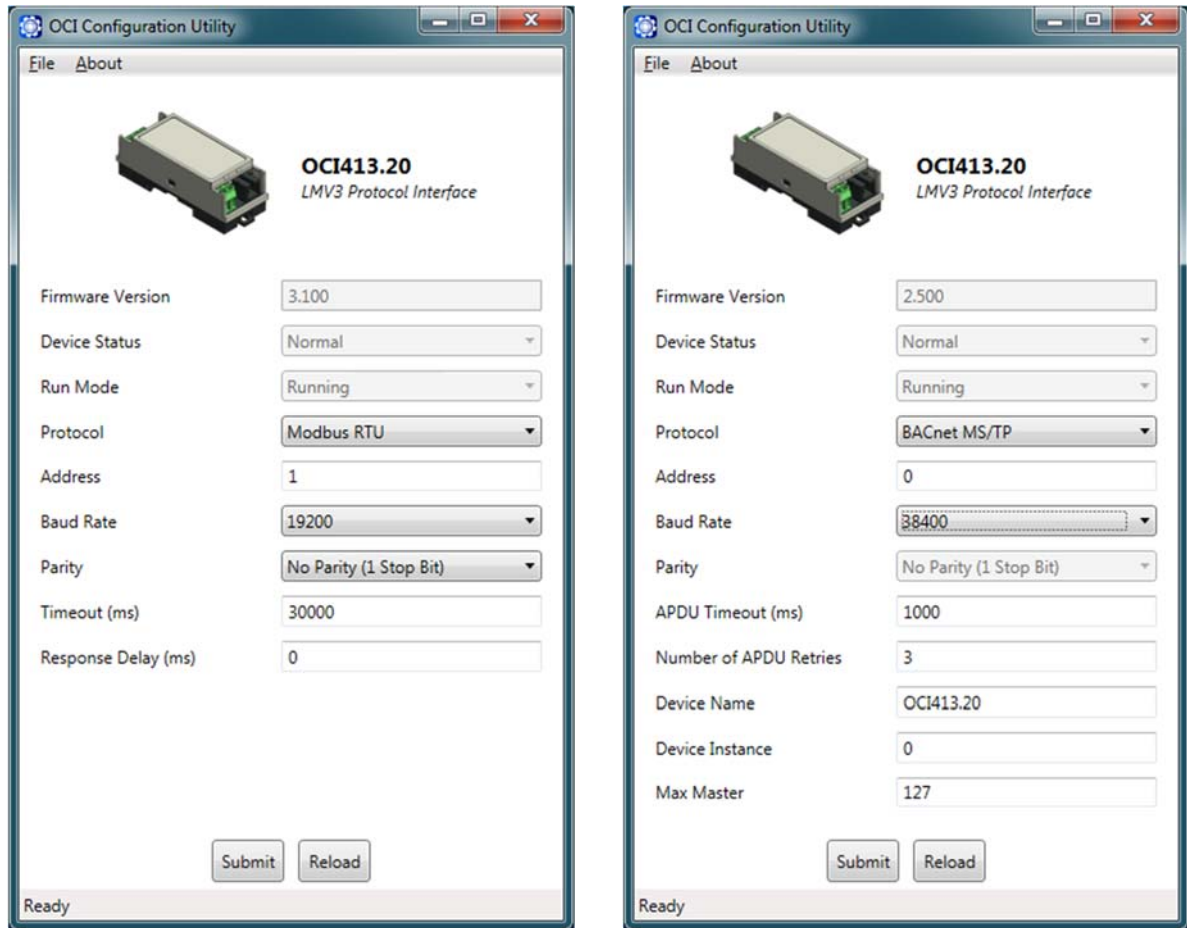


2. The utility will open and show the connection status of the OCI413.20.



Configuration Utility (continued)

- Use a mini-USB cable to connect the OCI413.20 to the computer, such as **SCC part number AGA5-05M**. A driver may self-install the first time a connection is made. The connected device will then be indicated on the screen.



- The protocol can be changed between Modbus RTU and BACnet MS/TP from this screen. See the previous sections for further details on the protocol-specific settings that can be changed. Once the desired settings have been entered, click **Submit** to apply. Click **Reload** to refresh the displayed settings.

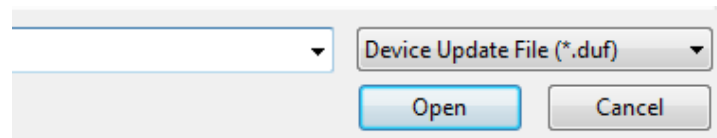
Configuration Utility (continued)

Updating Firmware

1. From the OCI413.20 Configuration Utility, click **File -> Update Device...**



2. Locate the supplied update file with a **.duf** extension and click **Open**.



3. The device will automatically reboot and reconnect with the OCI413.20 Configuration Utility once the firmware update is complete. When a device is connected, the firmware version is shown as one of the read-only parameters.

Firmware Version

Modbus RTU Mapping

Refer to Document No. LV3-1000 (LMV3 Technical Instructions) for complete Modbus mapping information.

BACnet MS/TP Mapping

Point Name	Type	Instance	Units	Active Text	Inactive Text
PHASE	ANALOG INPUT	1	NO UNITS	-	-
FUEL ACTUATOR	ANALOG INPUT	2	ANG DEG	-	-
AIR ACTUATOR	ANALOG INPUT	3	ANG DEG	-	-
VSD	ANALOG INPUT	4	PERCENT	-	-
CURRENT OUTPUT	ANALOG INPUT	5	PERCENT	-	-
FLAME SIGNAL	ANALOG INPUT	6	PERCENT	-	-
FUEL FLOW	ANALOG INPUT	7	NO UNITS	-	-
START COUNTER	ANALOG INPUT	8	NO UNITS	-	-
ERROR CODE	ANALOG INPUT	9	NO UNITS	-	-
DIAGNOSTIC CODE	ANALOG INPUT	10	NO UNITS	-	-
ERROR CLASS	ANALOG INPUT	11	NO UNITS	-	-
ERROR PHASE	ANALOG INPUT	12	NO UNITS	-	-
PROGRAM STOP (SEE NOTE 1)	ANALOG VALUE	13	NO UNITS	-	-
LOCAL REMOTE (SEE NOTE 2)	ANALOG VALUE	14	NO UNITS	-	-
TIMEOUT	ANALOG VALUE	15	SECONDS	-	-
REMOTE MODE (SEE NOTE 2)	ANALOG VALUE	16	NO UNITS	-	-
REMOTE FIRE RATE (SEE NOTE 2)	ANALOG VALUE	17	PERCENT	-	-
HOURS F0 RESET (SEE NOTE 3)	ANALOG VALUE	18	HOURS	-	-
HOURS F1 RESET (SEE NOTE 3)	ANALOG VALUE	19	HOURS	-	-
HOURS POWERED	ANALOG INPUT	20	HOURS	-	-
STARTS F0 RESET (SEE NOTE 3)	ANALOG VALUE	21	NO UNITS	-	-
STARTS F1 RESET (SEE NOTE 3)	ANALOG VALUE	22	NO UNITS	-	-
STARTS TOTAL	ANALOG INPUT	23	NO UNITS	-	-
FUEL VOLUME F0 (SEE NOTE 3)	ANALOG VALUE	24	NO UNITS	-	-
FUEL VOLUME F1 (SEE NOTE 3)	ANALOG VALUE	25	NO UNITS	-	-
NUMBER OF FAULTS	ANALOG INPUT	26	NO UNITS	-	-
FAILSAFE RATE F0	ANALOG VALUE	27	PERCENT	-	-
FAILSAFE RATE F1	ANALOG VALUE	28	PERCENT	-	-
MINIMUM FIRE RATE F0	ANALOG INPUT	29	PERCENT	-	-
MAXIMUM FIRE RATE F0	ANALOG INPUT	30	PERCENT	-	-
MINIMUM FIRE RATE F1	ANALOG INPUT	31	PERCENT	-	-
MAXIMUM FIRE RATE F1	ANALOG INPUT	32	PERCENT	-	-
BURNER MODE F0	ANALOG INPUT	33	NO UNITS	-	-
BURNER MODE F1	ANALOG INPUT	34	NO UNITS	-	-
REVERT TO PILOT CYCLES	ANALOG INPUT	35	NO UNITS	-	-
LOWER LIMIT TRIM FUEL 0	ANALOG INPUT	36	PERCENT	-	-
UPPER LIMIT TRIM FUEL 0	ANALOG INPUT	37	PERCENT	-	-
LOWER LIMIT TRIM FUEL 1	ANALOG INPUT	38	PERCENT	-	-
UPPER LIMIT TRIM FUEL 1	ANALOG INPUT	39	PERCENT	-	-
ANALOG INPUT TRIM	ANALOG INPUT	40	PERCENT	-	-
CURRENT TRIM CORRECTION	ANALOG INPUT	41	PERCENT	-	-
ABSOLUTE FAN SPEED	ANALOG INPUT	42	RPM	-	-
MAINS VOLTAGE	ANALOG INPUT	43	VOLTS	-	-
ERR CODE HIST (SEE NOTE 4)	ANALOG INPUT	(10 * x) + 50	NO UNITS	-	-
DIAG CODE HIST (SEE NOTE 4)	ANALOG INPUT	(10 * x) + 51	NO UNITS	-	-

BACnet MS/TP Mapping (continued)

Point Name	Type	Instance	Units	Active Text	Inactive Text
ERR CLASS HIST (SEE NOTE 4)	ANALOG INPUT	(10 * x) + 52	NO UNITS	-	-
ERR PHASE HIST (SEE NOTE 4)	ANALOG INPUT	(10 * x) + 53	NO UNITS	-	-
ERR OUTPUT HIST (SEE NOTE 4)	ANALOG INPUT	(10 * x) + 54	PERCENT	-	-
ERR STARTS HIST (SEE NOTE 4)	ANALOG INPUT	(10 * x) + 55	NO UNITS	-	-
CURRENT FUEL	BINARY INPUT	1	-	OIL	GAS
CONTROL SWITCH	BINARY INPUT	2	-	ON	OFF
VALVE PROVING	BINARY INPUT	3	-	ON	OFF
SAFETY LOOP	BINARY INPUT	4	-	ON	OFF
LOW FUEL PRESSURE SWITCH	BINARY INPUT	5	-	ON	OFF
HIGH FUEL PRESSURE SWITCH	BINARY INPUT	6	-	ON	OFF
AIR PRESSURE SWITCH	BINARY INPUT	7	-	ON	OFF
ALARM	BINARY INPUT	8	-	ON	OFF
IGNITION	BINARY INPUT	9	-	ON	OFF
FAN	BINARY INPUT	10	-	ON	OFF
FUEL VALVE 1	BINARY INPUT	11	-	ON	OFF
FUEL VALVE 2	BINARY INPUT	12	-	ON	OFF
FUEL VALVE 3	BINARY INPUT	13	-	ON	OFF
FUEL HISTORY CURRENT	BINARY INPUT	14	-	OIL	GAS
FUEL HISTORY 1	BINARY INPUT	15	-	OIL	GAS
FUEL HISTORY 2	BINARY INPUT	16	-	OIL	GAS
FUEL HISTORY 3	BINARY INPUT	17	-	OIL	GAS
FUEL HISTORY 4	BINARY INPUT	18	-	OIL	GAS
FUEL HISTORY 5	BINARY INPUT	19	-	OIL	GAS
FUEL HISTORY 6	BINARY INPUT	20	-	OIL	GAS
FUEL HISTORY 7	BINARY INPUT	21	-	OIL	GAS
FUEL HISTORY 8	BINARY INPUT	22	-	OIL	GAS
FUEL HISTORY 9	BINARY INPUT	23	-	OIL	GAS
FUEL HISTORY 10	BINARY INPUT	24	-	OIL	GAS
FUEL HISTORY 11	BINARY INPUT	25	-	OIL	GAS
FUEL HISTORY 12	BINARY INPUT	26	-	OIL	GAS
FUEL HISTORY 13	BINARY INPUT	27	-	OIL	GAS
FUEL HISTORY 14	BINARY INPUT	28	-	OIL	GAS
FUEL HISTORY 15	BINARY INPUT	29	-	OIL	GAS
FUEL HISTORY 16	BINARY INPUT	30	-	OIL	GAS
FUEL HISTORY 17	BINARY INPUT	31	-	OIL	GAS
FUEL HISTORY 18	BINARY INPUT	32	-	OIL	GAS
FUEL HISTORY 19	BINARY INPUT	33	-	OIL	GAS
FUEL HISTORY 20	BINARY INPUT	34	-	OIL	GAS
FUEL HISTORY 21	BINARY INPUT	35	-	OIL	GAS
FUEL HISTORY 22	BINARY INPUT	36	-	OIL	GAS
FUEL HISTORY 23	BINARY INPUT	37	-	OIL	GAS
FUEL HISTORY 24	BINARY INPUT	38	-	OIL	GAS

BACnet MS/TP Mapping (continued)

Refer to Document No. LV3-1000 (LMV3 Technical Instructions) for further detail on parsing phase and error code information.

Note 1 – LMV program stop.

- **0:** deactivated
- **1:** prepurge phase 24
- **2:** ignition position phase 36
- **3:** interval 1 phase 44
- **4:** interval 2 phase 52

Note 2 – Set local/remote (AV14) to 1 for remote. Once in remote the desired mode can be set using AV16 (0 = local/automatic, 1 = burner on, 2 = burner off). If AV16 is set to burner on, write the desired firing rate using AV17. The firing rate must be between 20% and 100% to remain valid. AV14 must be actively written at least once during the timeout period to reset the timeout counter. Once the timeout counter reaches the timeout value local/remote will revert to local (failsafe operation).

Note 3 – Counter values can only be reset to zero.

Note 4 – There are 24 errors in memory. The addresses for the historical data are all in the same format as shown in the mapping. Use the formula to find the correct instance. For example, the error code analog input instance for history index 4 would be $(10 \times 4) + 50 = 90$.

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