

DESMI OptiSave™

Data Sheet

ModBus TCP / RTU
OPTISAVE SYSTEM



DESMI OptiSave™

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Document Change Control

This section provides control for the development and distribution of revisions.

The table below includes the revision number, the date of update/issue, the author responsible for the changes, and a brief description of the context and/or scope of the changes in that revision.

<i>Software Rev.</i>	<i>Revision Number</i>	<i>Date of Issue</i>	<i>Author(s)</i>	<i>Brief Description of Change</i>
1.6.015	A2	09-05-2019	Enma	First issue for 86k Beihai Project

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Technical description of MODBUS communication for DESMI OptiSave™.

As standard the DESMI OptiSave™ I equipped with at communication card for Modbus communication. This communication card is an Omron CJ1W-SCU41-V1 and is configured as MODBUS-RTU slave.

The AMS/CAMS/IACS system sends a command to the PLC. The PLC processes the command and returns a response to the AMS/CAMS/IACS system. This process is repeated, allowing the AMS/CAMS/IACS system to monitor the operation status of the DESMI OptiSave™.

Configuration of Communication card

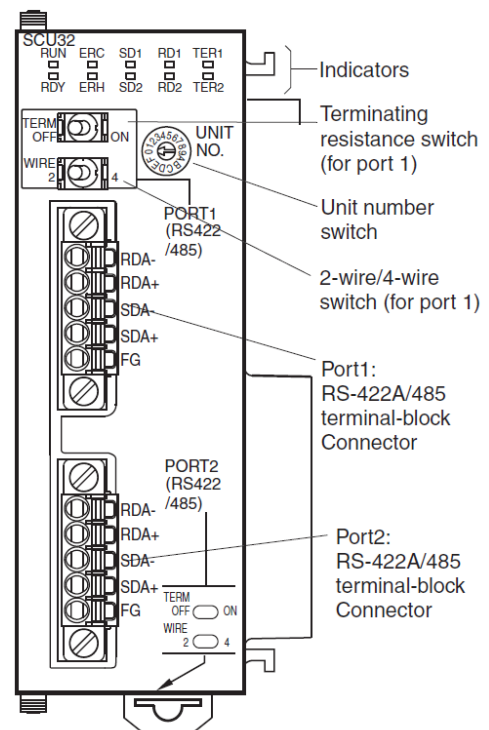
On the front of the MODBUS communication card there is two connection ports for MODBUS communication.

Port no. 1&2 are RS-422A / RS-485 communication port.
Port no. 2 are not in use in this project.

The card is always unit number 6. The unit number can be set on the unit number switch of the card.

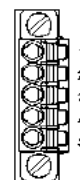
As default is the termination resistance set to ON.

CJ1W-SCU32



Connector Pin Layout (CJ1W-SCU32/SCU42)

Pin No.	Abbreviation	Signal name	I/O
1 *1	RDA	Receive data-	Input
2 *1	RDB	Receive data+	Input
3 *1	SDA	Send data-	Output
4 *1	SDB	Send data+	Output
5 *2	FG	Shield	—



*1. For 2-wire connections, use either pins 1 and 2 or pins 3 and 4.

*2. Pin 5 (the shield) is connected to the GR terminal on the Power Supply Unit though the Serial Communications Unit. The cable shield can thus be grounded by grounding the GR terminal of the Power Supply Unit.

Note: The signal names SDA/B and RDA/B do not always have the same polarity as that shown above. Check the polarity of the external device before making connections.

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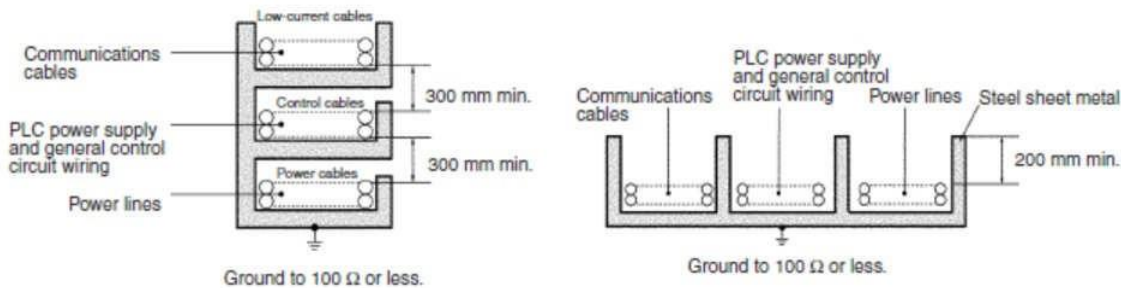
When installation the MODBUS INTERface to the OptiSave™ the plugs and cables shall be of high quality, to ensure the best performance. DESMI recommend following product:

Plugs shall be like MC1.5/5-SFT-3.5AU from Phoenix Contact

Cables shall be like CO-HC-ESV-3Px7/0.2 from Hirajawa Hewtech

Reducing Electrical Noise for External Wiring

When installing the MODBUS cable from the OptiSave™ control panel to the AMS/CAMS/IACS system, the installer shall make sure that the MODBUS cables is NOT installed together with power cables. There shall be at least 300mm of respect distance. See drawing below for further information.



MODBUS -RTU specification

The OptiSave™ MODBUS configuration has a default setting and can only be modified by DESMI personal. Only MODBUS-RTU slave is supported.

<i>Item</i>	<i>Description</i>
Mode	MODBUS-RTU slave mode
Baud rate	9600 bps
Date length	8 bits
Parity	None
MODBUS slave address	10

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Data on MODBUS

The data is divided into 3 data types- These types are digital status bit, analogue values and digital command signals.

SW system Digital status bit on MODBUS

DESMI OptiSave MODBUS Slave				
Modbus Address (Function code 03 Word)				
Address word read	Content	PLC Address	Data Type	Value to receiver
41001	Optisave system	E0_1000	BOOL	Bit 0 Common Alarm Bit 1 System OK Bit 2 SW I/O Module Communication Lost Bit 3 Bit 4 FAN I/O Module Communication Lost Bit 5
41002	SW pump 1	E0_1001	BOOL	Bit 0 Running Bit 1 Failure Bit 2 Remote mode Bit 3 Auto/Man. mode Bit 4 Master mode Bit 5 Slave mode Bit 6 Standby mode Bit 7 Standby started Bit 8 Bypass/VFD mode Bit 9 Communication Lost
41003	SW pump 2	E0_1002	BOOL	Bit 0 Running Bit 1 Failure Bit 2 Remote mode Bit 3 Auto/Man. mode Bit 4 Master mode Bit 5 Slave mode Bit 6 Standby mode Bit 7 Standby started Bit 8 Bypass/VFD mode Bit 9 Communication Lost

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41004	SW pump 3	E0_1003	BOOL	Bit 0 Running Bit 1 Failure Bit 2 Remote mode Bit 3 Auto/Man. mode Bit 4 Master mode Bit 5 Slave mode Bit 6 Standby mode Bit 7 Standby started Bit 8 Bypass/VFD mode Bit 9 Communication Lost
41005	Spare	E0_1004	BOOL	Digital Output
41006	Spare	E0_1005	BOOL	Digital Output
41007	Spare	E0_1006	BOOL	Digital Output
41008	FW Outlet Temp.	E0_1007	INT	Value in °C
41009	SW Inlet Temp.	E0_1008	INT	Value in °C
41010	SW Outlet Temp. 1	E0_1009	INT	Value in °C
41011	SW Outlet Temp. 2	E0_1010	INT	Value in °C
41012	SW Inlet Press.	E0_1011	INT	Value in Bar
41013	Temp. setpoint for LT/FW 3-WAY	E0_1012	INT	Value in °C
41014	SW VSD 1 Speed	E0_1013	INT	Value in Hz
41015	SW VSD 1 Actual kW	E0_1014	INT	Value in kW
41016	SW VSD 1 Actual Current	E0_1015	INT	Value in A
41017	SW VSD 2 Speed	E0_1016	INT	Value in Hz
41018	SW VSD 2 Actual kW	E0_1017	INT	Value in kW
41019	SW VSD 2 Actual Current	E0_1018	INT	Value in A
41020	SW VSD 3 Speed	E0_1019	INT	Value in Hz
41021	SW VSD 3 Actual kW	E0_1020	INT	Value in kW
41022	SW VSD 3 Actual Current	E0_1021	INT	Value in A
41023	Spare	E0_1022	INT	
41024	Spare	E0_1023	INT	

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E/F System Digital command bit on MODBUS

DESMI OptiSave MODBUS Slave				
Modbus Address (Function code 03 Word)				
Address word read	Content	PLC Address	Data Type	Value to receiver
41201	ER FAN 1	E0_1200	BOOL	Bit 0 Fore.Running Bit 1 Rev. Running Bit 2 Failure Bit 3 Remote mode Bit 4 Auto/Man. mode Bit 5 Bypass/VFD mode Bit 6 Bit 7 Bit 8 Bit 9 Communication Lost
41202	ER FAN 2	E0_1201	BOOL	Bit 0 Running Bit 1 Bit 2 Failure Bit 3 Remote mode Bit 4 Auto/Man. mode Bit 5 Bypass/VFD mode Bit 6 Bit 7 Bit 8 Bit 9 Communication Lost
41203	ER FAN 3	E0_1202	BOOL	Bit 0 Fore.Running Bit 1 Rev. Running Bit 2 Failure Bit 3 Remote mode Bit 4 Auto/Man. mode Bit 5 Bypass/VFD mode Bit 6 Bit 7 Bit 8 Bit 9 Communication Lost

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41204	ER FAN 4	E0_1103	BOOL	Bit 0 Running Bit 1 Bit 2 Failure Bit 3 Remote mode Bit 4 Auto/Man. mode Bit 5 Bypass/VFD mode Bit 6 Bit 7 Bit 8 Bit 9 Communication Lost
41205	Spare	E0_1204	BOOL	Digital Output
41206	Spare	E0_1205	BOOL	Digital Output
41207	Spare	E0_1206	BOOL	Digital Output
41208	ER Temp. 1	E0_1207	INT	Value in °C
41209	ER Temp. 2	E0_1208	INT	Value in °C
41210	ER Temp. 3	E0_1209	INT	Value in °C
41211	ER Temp. 4	E0_1210	INT	Value in °C
41212	ER DIFF Press.	E0_1211	INT	Value in Pa
41213	Spare	E0_1212	INT	
41214	E/F 1 Speed	E0_1213	INT	Value in Hz
41215	E/F 1 Actual kW	E0_1214	INT	Value in kW
41216	E/F 1 Actual Current	E0_1215	INT	Value in A
41217	E/F 2 Speed	E0_1216	INT	Value in Hz
41218	E/F 2 Actual kW	E0_1217	INT	Value in kW
41219	E/F 2 Actual Current	E0_1218	INT	Value in A
41210	E/F 3 Speed	E0_1219	INT	Value in Hz
41221	E/F 3 Actual kW	E0_1220	INT	Value in kW
41222	E/F 3 Actual Current	E0_1221	INT	Value in A
41223	E/F 4 Speed	E0_1222	INT	Value in Hz
41224	E/F 4 Actual kW	E0_1223	INT	Value in kW

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41225	E/F 4 Actual Current	E0_1224	INT	Value in A
41226		E0_1225	INT	
41227		E0_1226	INT	