

#### System Components



### System Components

#### Product Description

The start of the SmartWire-DT system is a gateway module. The gateway connects as a node to a programmable logic controller (PLC) fieldbus. The PLC used must have a fieldbus polling master module or input/output (I/O) scanner card so that the gateway can connect as a node on the fieldbus network. SmartWire-DT can connect to EtherNet/IP, Modbus TCP, PROFIBUS-DP and CANopen fieldbuses. To plan and lay out a SmartWire-DT network, a MS Windows compatible software program called SWD-Assist is available as a free download from the Eaton website. The SWD-Assist configuration software will calculate the control power requirements needed and generate a bill of materials of all the required components.

#### Gateway Modules

Gateway modules connect the SmartWire-DT system to the PLC. They are connected as nodes to the existing PLC fieldbus and are the start of the SmartWire-DT connection system. Gateways are available with Ethernet, PROFIBUS-DP and CANopen protocols.

#### Powerfeed Modules

Powerfeed modules feed auxiliary 24 Vdc power and/or 15 Vdc network power into the SmartWire-DT flat cable. The auxiliary 24 Vdc power is needed for the power supply of contactors and the 15 Vdc network power is used for supplying power to additional SmartWire-DT nodes. Powerfeed modules are also used to create zone control or groups of devices controlled by a single Emergency Stop.

#### Digital and Analog I/O Modules

Digital and analog I/O modules are connected as nodes on the SmartWire-DT network and allow standard or generic devices to be connected to the SmartWire-DT system. They can be connected anywhere along the flat cable network and can therefore be positioned in the control panel to help reduce the I/O wiring.

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#### Contactor Modules

Contactor modules fit into standard XT contactors and control relays directly on top, in place of a top mounted auxiliary contact block. The modules fit all XTCE size B and C frame contactors and XTRE control relays.

#### Pilot Device Modules

Pilot device modules fit into standard M22 pilot devices in both front mount and base mount configurations. Single and double contact modules with and without LEDs are available to meet a wide variety of control circuit requirements.

#### Flat and Round Cables

The flat cable is an 8 AWG 24 conductor cable that is flexible, durable, and rated for 600V so that it can be placed in the panel wiring duct along with 480V or 600V power conductors. It has two prominent features: (a) arrows indicating the front of the cable and the direction away from the gateway and (b) black edging indicating the polarity of the flat cable, the 15 Vdc wire and the reference mark for installing the device plugs and flat plugs.

The round cable has 4 AWG 20 and 4 AWG 24 wires and is 300V rated. It is used outside the control panel to connect peripherals such as pushbutton control stations to the SmartWire-DT network. Cable adapters are available to transition a flat cable to a round cable connection and IP67 type connectors are available to provide quick-disconnect cable connections on the round cable.

#### Other System Accessories

Other accessories for the SmartWire-DT system include connectors, jumpers, bushings, plugs, and sockets, flat to round cable adapters and crimping tools.

**Product Selection**

**Gateway Module**



**Gateway Modules**

Gateway modules connect the SmartWire-DT system to the programmable logic controller (PLC). They are connected as nodes to the existing PLC fieldbus and are the start of the SmartWire-DT connection system.

Description	Pkg. Qty.	Catalog Number
Ethernet Gateway Connection to EtherNet/IP or Modbus TCP Automatic baud rate detection 10/100 Mbps Address set with DIP switch or DHCP Two RJ45 sockets Connection of up to 99 SmartWire-DT nodes	1	<b>EU5C-SWD-EIP-MODTCP</b>
PROFIBUS-DP Gateway Automatic baud rate detection from 9.6 Kbps to 12 Mbps Address range 1–126 9-pole SUB-D socket Connection of up to 58 SmartWire-DT nodes	1	<b>EU5C-SWD-DP</b>
CANopen Gateway Automatic baud rate detection from 10 Kbps to 1 Mbps Address range 1–32 9-pole SUB-D socket Connection of up to 99 SmartWire-DT nodes	1	<b>EU5C-SWD-CAN</b>

**Powerfeed Module**



**Powerfeed Modules**

Powerfeed modules feed auxiliary 24 Vdc power and/or 15 Vdc network power into the SmartWire-DT flat cable. The auxiliary 24 Vdc power is needed for the power supply of contactors and the 15 Vdc network power is used for supplying power to additional SmartWire-DT nodes. Powerfeed modules are also used to create zone control or groups of devices controlled by a single Emergency Stop.

Description	Pkg. Qty.	Catalog Number
Powerfeed module 1 (for 24 Vdc auxiliary power)	1	<b>EU5C-SWD-PF1-1</b>
Powerfeed module 2 (for 24 Vdc auxiliary power and 15 Vdc network power)	1	<b>EU5C-SWD-PF2-1</b>

**Digital I/O Module**



**Digital I/O Modules**

Digital input/output (I/O) modules are connected as nodes on the SmartWire-DT network and allow standard or generic devices to be connected to the SmartWire-DT system. They can be connected anywhere along the flat cable network and can therefore be positioned in the control panel to help reduce the I/O wiring.

Description	Pkg. Qty.	Catalog Number
Digital module with 8 digital inputs 24 Vdc	1	<b>EU5E-SWD-8DX</b>
Digital module with 4 digital inputs 24 Vdc three-wire connections	1	<b>EU5E-SWD-4DX</b>
Digital module with 8 digital outputs 24 Vdc 10.5A	1	<b>EU5E-SWD-X8D</b>
Digital module with 4 digital inputs 24 Vdc and 4 transistor outputs 24 Vdc/0.5A	1	<b>EU5E-SWD-4D4D</b>
Digital module with 4 digital inputs 24 Vdc and 2 relay outputs 250 Vac	1	<b>EU5E-SWD-4D2R</b>

**Analog I/O Module**



**Analog I/O Modules**

Analog input/output (I/O) modules are connected as nodes on the SmartWire-DT network and allow standard or generic devices to be connected to the SmartWire-DT system. They can be connected anywhere along the flat cable network and can therefore be positioned in the control panel to help reduce the I/O wiring.

Description	Pkg. Qty.	Catalog Number
Analog module with 4 analog inputs 0–10V or 0–20 mA	1	<b>EU5E-SWD-4AX</b>
Analog module with 2 analog inputs 0–10V or 0–20 mA and 2 analog outputs 0–10V or 0–20 mA	1	<b>EU5E-SWD-2A2A</b>
RTD module with 4 temperature inputs PT100, PT1000 or Ni1000	1	<b>EU5E-SWD-4PT</b>

## Input/Output Modules

Description	Unit	EU5E-SWD-8DX	EU5E-SWD-4DX	EU5E-SWD-4D4D	EU5E-SWD-4D2R	EU5E-SWD-X8D
<b>General</b>						
Standards		IEC/EN 61131-2; EN 50178				
Dimensions (W x H x D)	in (mm)	1.38 x 3.54 x 3.97 (35 x 90 x 101)	1.38 x 3.54 x 3.97 (35 x 90 x 101)	1.38 x 3.54 x 3.97 (35 x 90 x 101)	1.38 x 3.54 x 3.97 (35 x 90 x 101)	1.38 x 3.54 x 3.97 (35 x 90 x 101)
Weight	lbs (kg)	0.22 (0.10)	0.22 (0.10)	0.22 (0.10)	0.22 (0.10)	0.22 (0.10)
Mounting		DIN rail IEC/EN 60715, 35 mm	Top-hat rail IEC/ EN 60715, 35 mm	DIN rail IEC/EN 60715, 35 mm	DIN rail IEC/EN 60715, 35 mm	Top-hat rail IEC/ EN 60715, 35 mm
Mounting position		Vertical	Vertical	Vertical	Vertical	Vertical
<b>Ambient Conditions, Mechanical</b>						
Degree of protection (IEC/EN 60529)		IP20	IP20	IP20	IP20	IP20
Vibrations (IEC/EN 61131-2:2008)						
Constant amplitude 3.5 mm	Hz	5–8.4	5–8.4	5–8.4	5–8.4	5–8.4
Constant acceleration 1g	Hz	8.4–150	8.4–150	8.4–150	8.4–150	8.4–150
Mechanical shock resistance (IEC/EN 60068-2-27) semi-sinusoidal 15g/11 ms	Impacts	9	9	9	9	9
Drop to IEC/EN 60068-2-31 (drop height)	in (mm)	1.97 (50)	1.97 (50)	1.97 (50)	1.97 (50)	1.97 (50)
Free fall, packaged (IEC/EN 60068-2-32)	ft (m)	1.0 (0.3)	1.0 (0.3)	1.0 (0.3)	1.0 (0.3)	1.0 (0.3)
<b>Electromagnetic Compatibility (EMC)</b>						
Overvoltage category		II	II	II	II	II
Pollution degree		2	2	2	2	2
Electrostatic discharge (IEC/EN 61131-2:2008)						
Air discharge (Level 3)	kV	8	8	8	8	8
Contact discharge (Level 2)	kV	4	4	4	4	4
Electromagnetic fields (IEC/EN 61131-2:2008)						
80–1000 MHz	V/m	10	10	10	10	10
1.4–2 GHz	V/m	3	3	3	3	3
2–2.7 GHz	V/m	1	1	1	1	1
Radio interference suppression (SmartWire-DT)		EN 55011 Class A				
Burst (IEC/EN 61131-2:2008, Level 3)						
Supply cables	kV	2	2	2	2	2
Signal lines	kV	1	1	1	1	1
SmartWire-DT cables	kV	1	1	1	1	1
Surge (IEC/EN 61131-2:2008, Level 1)						
Supply cables	kV	0.5	0.5	0.5	0.5	0.5
Radiated RFI (IEC/EN 61131-2:2008, Level 3)	V	10	10	10	10	10
<b>Climatic Environmental Conditions</b>						
Operating ambient temperature (IEC 60068-2)	°F (°C)	–13° to 131° (–25° to 55°)				
Condensation		Prevent with suitable measures				
Storage	°F (°C)	–40° to 158° (–40° to 70°)				
Relative humidity, non-condensing (IEC/ EN 60068-2-30)	%	5–95	5–95	5–95	5–95	5–95
<b>SmartWire-DT Network</b>						
Station type		SmartWire-DT (node)	SmartWire-DT (slave)	SmartWire-DT (node)	SmartWire-DT (node)	SmartWire-DT (slave)
Address allocation		Automatic	Automatic	Automatic	Automatic	Automatic
SmartWire-DT status (LED)		Green	Green	Green	Green	Green
Connection						
Plug		8-pole	Plug, 8-pole	8-pole	8-pole	Plug, 8-pole
Connection plug		External device plug SWD4-8SF2-5				
Current consumption (15V SWD supply)		See <a href="#">Page V7-T9-33</a>				

**Note**

⊙ Minimum length 8 mm.

## Input/Output Modules, continued

Description	Unit	EU5E-SWD-8DX	EU5E-SWD-4DX	EU5E-SWD-4D4D	EU5E-SWD-4D2R	EU5E-SWD-X8D
<b>Connection Supply and I/O</b>						
Connection type		Push in terminals	Push in terminals	Push in terminals	Push in terminals	Push in terminals
Solid	mm <sup>2</sup>	0.2–1.5 (AWG 24–16)	0.2–1.5 (AWG 24–16)	0.2–1.5 (AWG 24–16)	0.2–1.5 (AWG 24–16)	0.2–1.5 (AWG 24–16)
Flexible with ferrule <sup>①</sup>	mm <sup>2</sup>	0.25–1.5 (AWG 24–16)	0.25–1.5	0.25–1.5	0.25–1.5	0.25–1.5 (AWG 24–16)
<b>24 Vdc Supply for Output Supply</b>						
Rated operational voltage ( $U_e$ )	V	24 Vdc (–15%/+20%)	24 Vdc (–15%/+20%)	24 Vdc (–15%/+20%)	24 Vdc (–15%/+20%)	24 Vdc (–15%/+20%)
Residual ripple on the input voltage	%	—	≤5	5	—	≤5
Protection against polarity reversal		—	Yes	Yes	—	Yes
<b>Digital Inputs</b>						
Quantity		8	4 <sup>①</sup>	4	4	—
Input current	mA	Typ. 4 at 24 Vdc	Typ. 4 at 24 Vdc	Typ. 4 at 24 Vdc	Typ. 4 at 24 Vdc	Typ. 4 at 24 Vdc
Voltage level to IEC/EN 61131-2						
Limit value type 1				Low <5 Vdc; High >15 Vdc		
Input delay						
High		<0.2 ms	<0.2 ms	<0.2 ms	<0.2 ms	<0.2 ms
Low		<0.2 ms	<0.2 ms	<0.2 ms	<0.2 ms	<0.2 ms
SmartWire-DT status (LED)		Yellow	Yellow	Yellow	Yellow	—
<b>Power Supply I+, I-</b>						
Overload proof		—	Yes, with diagnostics	—	—	—
Output current per input supply	A	—	≤0.5	—	—	—
Supply voltage	V	—	$U_e$ 0.16V	—	—	—
<b>Transistor Outputs</b>						
Number		—	—	4	—	8
Output current	A	—	—	Normally 0.5 at 24 Vdc	—	Normally 0.5 at 24 Vdc
Short-circuit tripping current	A	—	—	Max. 1.2 over 3 ms	—	Max. 1.2 over 3 ms
Lamp load ( $R_{LL}$ )	W	—	—	3	—	≤3
Overload proof		—	—	Yes, with diagnostics	—	Yes, with diagnostics
Switching capacity		—	—	EN 60947-5-1 utilization category DC-13	—	EN 60947-5-1 utilization category DC-13
Status display	LED	—	—	—	—	Yellow
<b>Relay Outputs</b>						
Number		—	—	—	2	—
Contact type art		—	—	—	N/O contact	—
Operations						
Utilization category AC-1, 250V, 6A		—	—	—	>6 x 10 <sup>4</sup>	—
Utilization category AC-15, 250V, 3A		—	—	—	>5 x 10 <sup>4</sup>	—
Utilization category DC-13, 24V, 1A		—	—	—	>2 x 10 <sup>5</sup>	—
Safe isolation	Vac	—	—	—	230	—
Minimum load current	mA	—	—	—	100 mA, 12 Vdc	—
Pick-up/drop-out time	ms	—	—	—	5/2.5	—
Bounce duration	ms	—	—	—	Normally 1.5	—
Short-circuit protection		—	—	—	External 4A gL/gG	—
Status display outputs (LED)		—	—	Yellow	Yellow	—
<b>Potential Isolation</b>						
Inputs for SmartWire-DT		Yes	Yes	Yes	Yes	Yes
Transistor outputs for SmartWire-DT		—	Yes	Yes	—	—
Transistor outputs for inputs		—	—	No	—	—
Relays for SmartWire-DT		—	—	—	Yes	—
Relays for inputs		—	—	—	Yes	—
Relays for relays		—	—	—	Yes	—

**Note**

<sup>①</sup> Three-wire connection with power supply I+, I-.