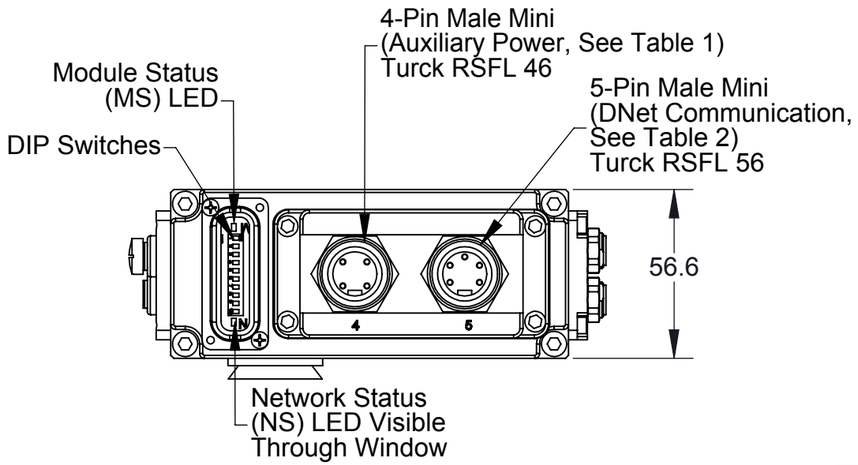
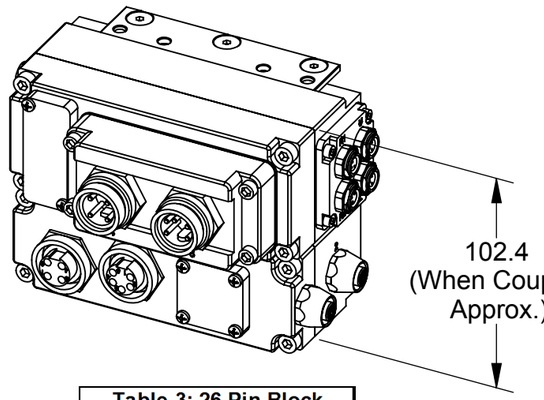
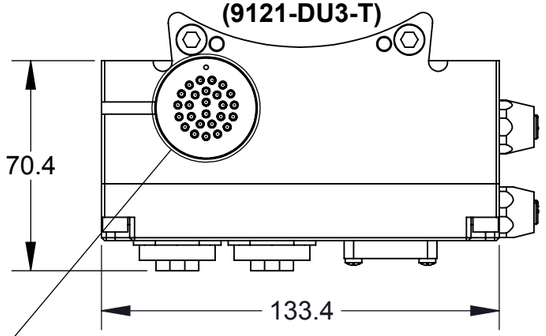
Rev.	Description	Initiator	Date
08	Removed pressure sensor guard. Project release.	WB	10/24/2016
09	Eco 15590; Added Sheets 5 and 6 outlining connection to single and multiple Safety Switches. Modified notes on Sheet 1 and 4.	WB	6/12/2017

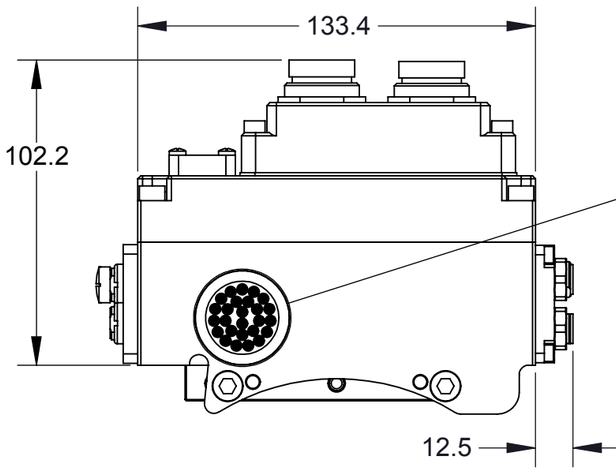
DU3 Master Module (9121-DU3-M)

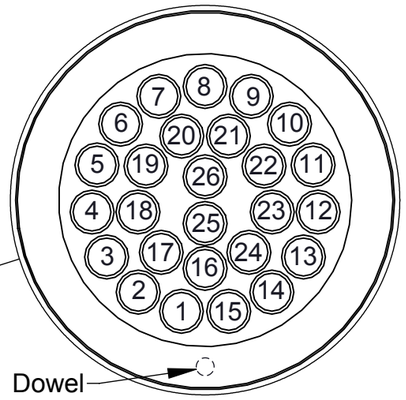




DU3 Tool Module (9121-DU3-T)

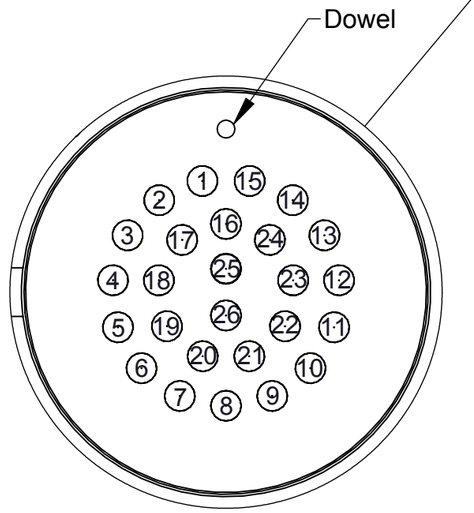




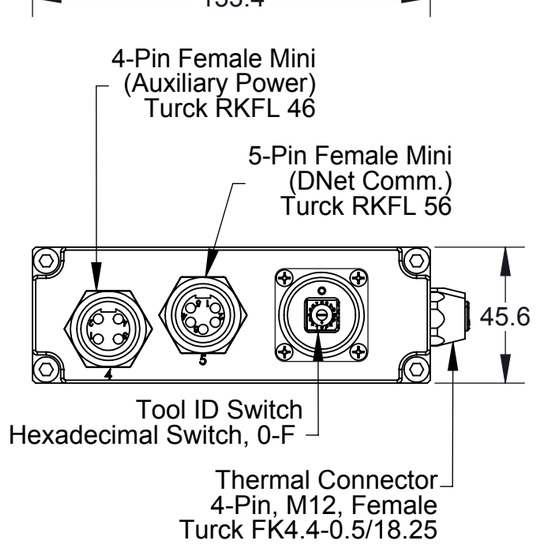


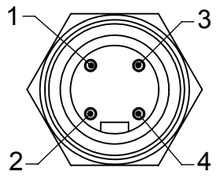
Master Pin Block
See Table 3

Table 3: 26-Pin Block Signal Designations	
1	CAN V+
2	TOOL ID1
3	TSI 1
4	TSRV2
5	TSI 2
6	TSRV1
7	N/C
8	UNLATCH IN
9	CAN_H
10	UNSW N1 (-24V)
11	THERMAL 1
12	UNSW P1 (0V)
13	CAN V-
14	N/C
15	UNLATCH OUT
16	CAN V+_TH
17	TOOL ID2
18	TOOL ID4
19	TOOL ID8
20	N/C
21	CAN_L
22	SW N2 (-24V)
23	SW P2 (0V)
24	N/C
25	TOOL PRESENT
26	DRAIN



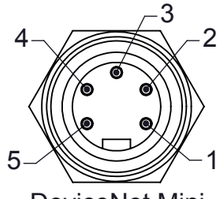
Tool Pin Block
See Table 3





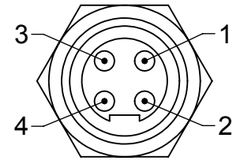
Auxiliary Power Mini
4-Pin Male, Turck RSFL 46

Table 1: Auxiliary Power Connector	
1	P2 (0V SW)
2	P1 (0V UNSW)
3	N1 (-24V UNSW)
4	N2 (-24V SW)

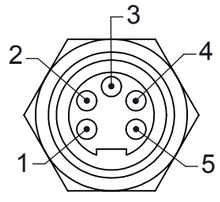


DeviceNet Mini
5-Pin Male, Turck RSFL 56

Table 2: DeviceNet Connector	
1	Drain
2	CAN V+
3	CAN V-
4	CAN_H
5	CAN_L



Auxiliary Power Mini
4-Pin Female, Turck RKFL 46
(See Table 1 Lower Left)



DeviceNet Mini
5-Pin Female, Turck RKFL 56
(See Table 2 Lower Left)

Notes:
1. Reference the manual for information related to DIP switch settings, LED behavior and general product operation.
2. Connectors are oriented as shown unless otherwise specified.
3. Electrical schematic and notes are shown on Sheets 3 and 4. Connection to Safety Switches is outlined on Sheets 5 and 6. Serviceable Parts are listed on Sheet 7.

NOTES: UNLESS OTHERWISE SPECIFIED.

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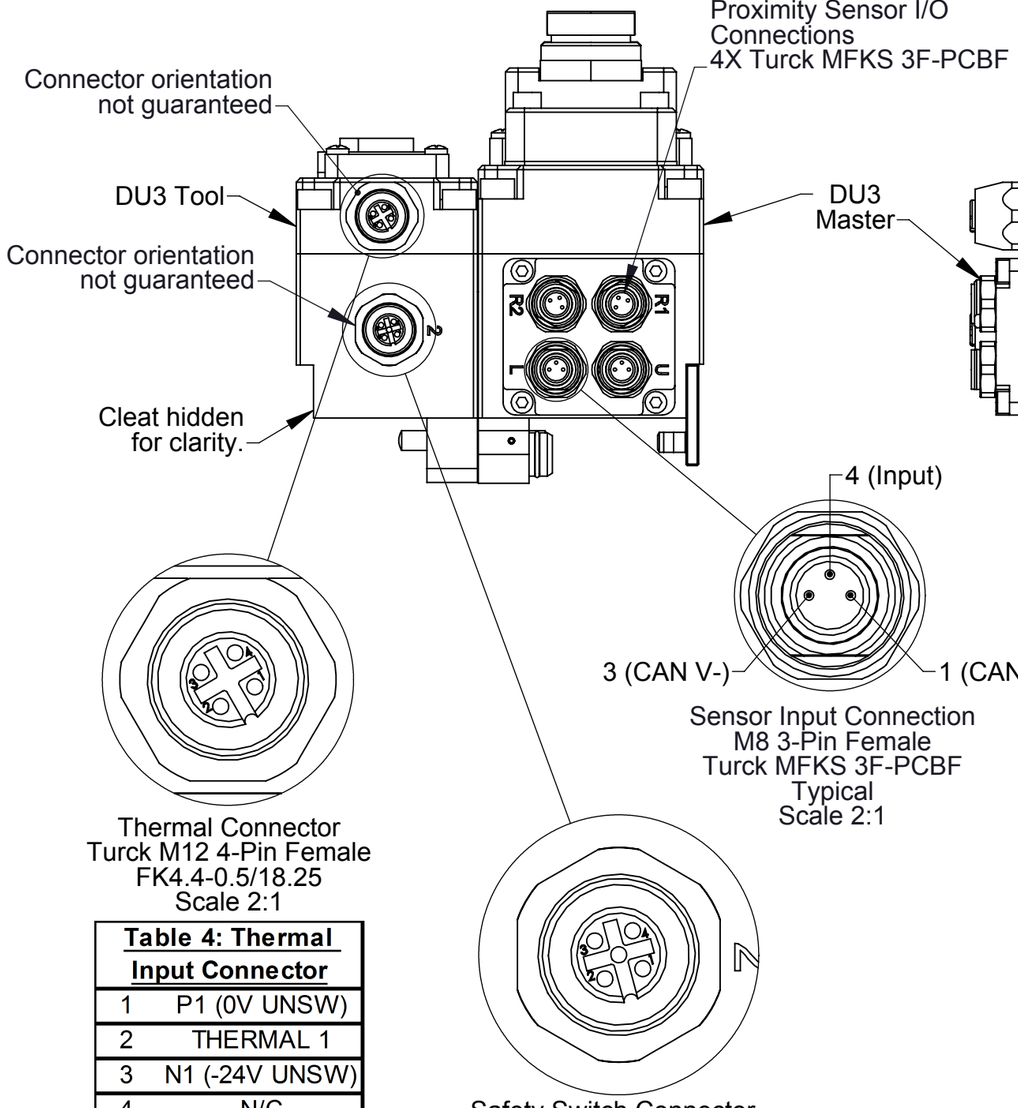
CHECKED BY: F. Alonso, 2/19/16

PROJECT # 141021-2 SHEET 1 OF 7

TITLE: DU3M DU3T Devicenet Module Customer Drawing

SCALE	SIZE	DRAWING NUMBER	REVISION
1:2	B	9630-20-DU3M DU3T	10

Rev.	Description	Initiator	Date
-	See Sheet1	-	-



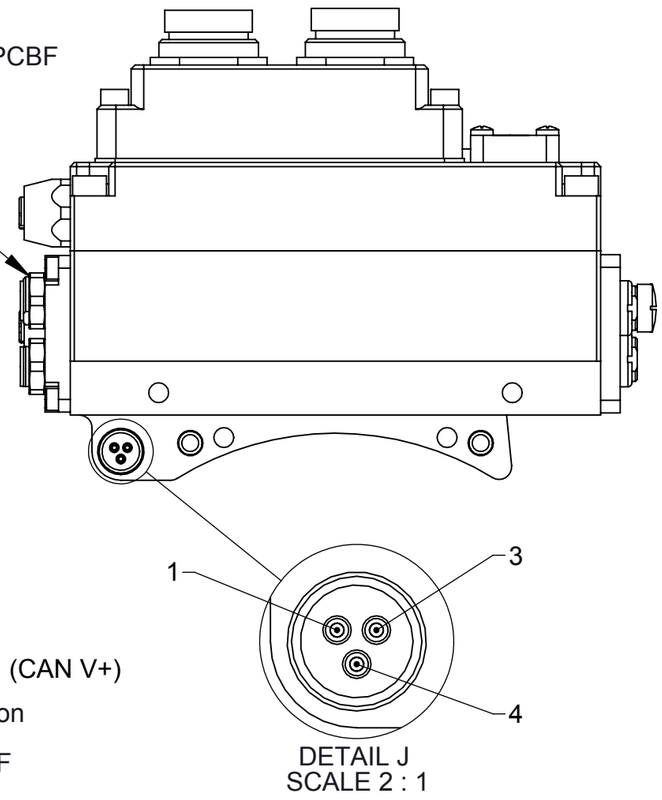
Thermal Connector
Turck M12 4-Pin Female
FK4.4-0.5/18.25
Scale 2:1

Sensor Input Connection
M8 3-Pin Female
Turck MFKS 3F-PCBF
Typical
Scale 2:1

Table 4: Thermal Input Connector	
1	P1 (0V UNSW)
2	THERMAL 1
3	N1 (-24V UNSW)
4	N/C

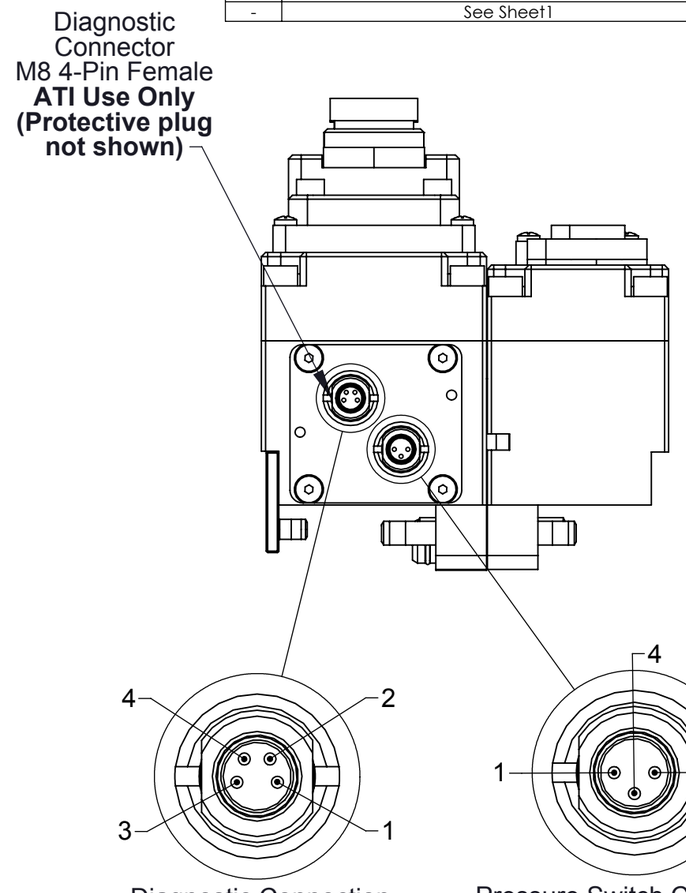
Safety Switch Connector
Turck M12 5-Pin Female
FK4.5-0.5/18.25
Scale 2:1

Table 5: Safety Switch Connector	
1	CAN V+_TH
2	TSI1
3	CAN V-
4	TSI2
5	N/C



DETAIL J
SCALE 2 : 1

Table 6: Valve Signal Pin Block	
1	UNLATCH (0V)
3	N2 (-24V SW)
4	LATCH (0V)



Diagnostic Connection
M8 4-Pin Female
Turck MFKS 4F
Scale 2:1

Table 7: Diagnostic Connector	
1	Tx+
2	Tx-
3	Rx+
4	Rx-

Pressure Switch Connection
M8 3-Pin Female
Turck MFKS 3F
Scale 2:1

Table 8: Pressure Switch Connector	
1	CAN V+_TH
3	N/C
4	Input

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CHECKED BY: F. Alonso, 2/19/16

PROJECT # 141021-2 SHEET 2 OF 7

TITLE: DU3M DU3T Devicenet Module Customer Drawing

SCALE	SIZE	DRAWING NUMBER	REVISION
2:3	B	9630-20-DU3M DU3T	10

Rev.	Description	Initiator	Date
-	See Sheet1	-	-

9121-DU3-M

26-PIN BLOCK INTERFACE

9121-DU3-T

DEVICENET CONNECTOR 5-PIN MALE MINIFAST

DRAIN 1
CAN V+ 2
CAN V- 3
CAN_H 4
CAN_L 5

AUX. POWER CONNECTOR 4-PIN MALE MINIFAST

SW P2 (0V) 1 — 0V
SW N2 (-24V) 4 — -24V
UNSW P1 (0V) 2 — 0V
UNSW N1 (-24V) 3 — -24V

POWER ON (NOTE 8)

CAN V+ (IN) / CAN V- — ARC SWITCH CIRCUIT 'C' — CAN V+ (OUT)

POWER ON (NOTE 8)

0V (IN) / -24V (N2) — ARC SWITCH CIRCUIT 'A' — 0V (OUT)

0V (IN) / -24V (N1) — ARC SWITCH CIRCUIT 'B' — 0V (OUT)

POWER ON (NOTE 8)

DEVICENET: DRAIN, CAN V+, CAN V-, CAN_H, CAN_L
AUX. POWER: P2 (0V SW), N2 (-24V SW)

INPUTS

NPN INPUTS
LOCKED
UNLOCKED
RTL (IN SERIES)

PNP INPUTS
TSI1
TSI2
TSRV1
TSRV2
TOOL PRESENT

TOOL PRESENCE IN (CAN V+)

THERMISTOR

RS485+
RS485-

AIR PRESSURE AVAIL. (PNP)

OUTPUTS
POWER ON
UNLATCH
LATCH

DEVICENET MASTER PCB

APC LOGIC PCB
CAN V+, CAN V-, N1 (-24V), P1 (0V)
RS485+, RS485-
THERMAL 1 (NPN)
TOOL ID1
TOOL ID2
TOOL ID4
TOOL ID8

FORCE GUIDED RELAY 2 (SEE NOTE 11)
COIL 2
TSRV2

FORCE GUIDED RELAY 1 (SEE NOTE 11)
COIL 1
TSRV1

7, 14, 20, 24 (N/C)
7, 14, 20, 24 (N/C)

CAN V+_TH

0-F TOOL ID SWITCH
1, 2, 4, 8

DEVICENET CONNECTOR 5-PIN FEMALE MINIFAST
DRAIN 1
CAN V+ 2
CAN V- 3
CAN_H 4
CAN_L 5

AUX. POWER CONNECTOR 4-PIN FEMALE MINIFAST
P1 (0V) 1
N2 (-24V) 4
P1 (0V) 2
N1 (-24V) 3

THERMAL CONNECTOR 4-PIN FEMALE M12
P1 (0V) 1
THERMAL 1 2
N1 (-24V) 3
N/C 4

SAFETY SWITCH CONNECTOR 5-PIN FEMALE M12 (NOTE 13)
CAN V+_TH 1
TSI1 2
CAN V- 3
TSI2 4
N/C 5

TOOL CHANGER SENSOR INPUTS 3-PIN FEMALE M8, TYPICAL (SEE NOTES 1 & 2)
CAN V+ 1, CAN V- 3, "L" 4
CAN V+ 1, CAN V- 3, "U" 4
CAN V+ 1, CAN V- 3, "R2" 4
CAN V+ 1, CAN V- 3, "R1" 4

PRESSURE SWITCH CONNECTOR 3-PIN FEMALE M8 SEE NOTE 9
CAN V+_TH 1
N/C 3
Input 4

DIAGNOSTIC CONNECTION 4-PIN FEMALE M8 ATI USE ONLY
1 2 3 4

VALVE ADAPTER CONNECTION 3-PIN PIN BLOCK NOTE 3
N2 (-24V) 3, LATCH (0V) 4, UNLATCH (0V) 1

NOTES: UNLESS OTHERWISE SPECIFIED.

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CHECKED BY: F. Alonso, 2/19/16
PROJECT # 141021-2 SHEET 3 OF 7

TITLE: DU3M DU3T Devicenet Module Customer Drawing

SCALE	SIZE	DRAWING NUMBER	REVISION
1:10	B	9630-20-DU3M DU3T	10

Rev.	Description	Initiator	Date
-	See Sheet1	-	-

Schematic Notes:

1. Note that the sensors are powered by DeviceNet power. The common V+ and V- connections are not shown here.
2. The complete tool changer package comes equipped with external cables that are connected to the sensors. The RTL, Locked, and Unlocked sensors are NPN.
3. The Latch and Unlatch signals are provided to a Double-Solenoid Valve Adapter via an internal 3-Pin Pin Block. Note: Only double-solenoid valves are supported.
4. In the event that a Tool Changer equipped with the tool changer is locked without a Tool, the only way to unlock the Tool Changer is to press the manual override button located on the control valve.
5. Cables for DeviceNet and Auxiliary Power to the DU3 Modules are supplied by the user.
6. The Tool ID I/O is reported in the DU3 Master Bitmap.
7. The Thermal 1 input from the Tool side M12 connector is NPN.
8. The Arc Prevention Circuits turn off DeviceNet and Auxiliary Power during coupling and uncoupling of the Master and Tool. The switching function is controlled by the "POWER ON" signal from the main PC Board. The TOOL PRESENT input is used to ensure that the spring/contact pins are touching when power is turned on. Refer to the product manual for additional information.
9. The Pressure Switch input indicates when the supply pressure is greater than 60 psi (PNP input). The CAN V+_TH connection is not shown here. Reference the customer drawing for the valve adapter for additional details.
10. The DU3 Tool is equipped with a 0-F rotary switch for setting the Tool ID. There are 16 unique tool IDs that can be selected.
11. The interlock relays in the DU3 Tool are Force Guided Relays. The 24V Unlatch is transmitted via the NO contacts. The relay diagnostic signals (i.e. TSRV1 and TSRV2) shall monitor the NC contacts (per EN50205, NO and NC contacts shall be used for Force Guided Relays). The relays are shown in the un-energized state, i.e. Tool not in the Tool Stand.
12. CAN V+_TH is current limited CAN V+ used to drive the TSI Relays and Safety Switch(es).
13. Connection to a single Safety Switch is shown on Sheet 5 (Figure 1). Series connection to two Safety Switches is shown on Sheet 5 (Figure 2). Series connection to more than two Safety Switches is shown on Sheet 6 (Figure 3).

NOTES: UNLESS OTHERWISE SPECIFIED.

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PROJECT # 141021-2 SHEET 4 OF 7

TITLE: DU3M DU3T Devicenet Module Customer Drawing

SCALE	SIZE	DRAWING NUMBER	REVISION
1:10	B	9630-20-DU3M DU3T	10

REV.	DESCRIPTION	INITIATOR	DATE
-	See Sheet1	-	-



Figure 1: Connection of 1X Euchner CES-AP-C01 Safety Sensor

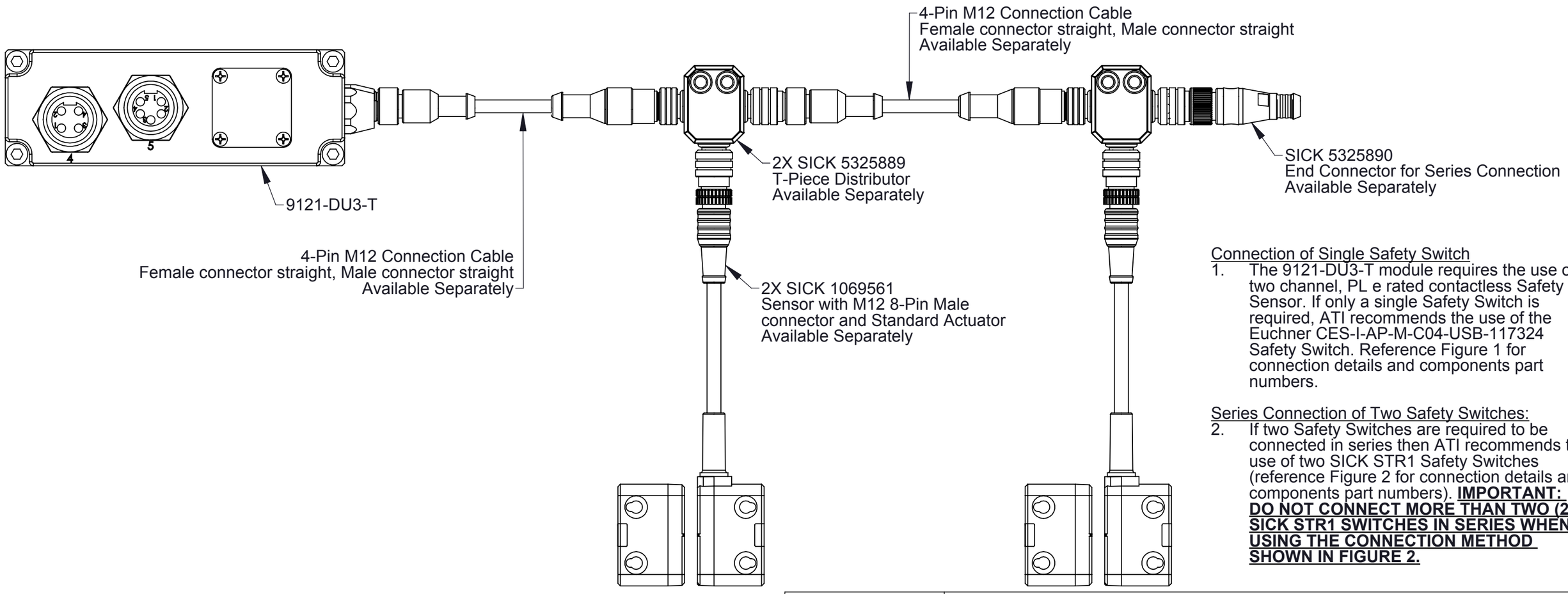


Figure 2: Connection of 2X SICK STR1 Safety Sensors in Series

Connection of Single Safety Switch

1. The 9121-DU3-T module requires the use of a two channel, PL e rated contactless Safety Sensor. If only a single Safety Switch is required, ATI recommends the use of the Euchner CES-I-AP-M-C04-USB-117324 Safety Switch. Reference Figure 1 for connection details and components part numbers.

Series Connection of Two Safety Switches:

2. If two Safety Switches are required to be connected in series then ATI recommends the use of two SICK STR1 Safety Switches (reference Figure 2 for connection details and components part numbers). **IMPORTANT: DO NOT CONNECT MORE THAN TWO (2) SICK STR1 SWITCHES IN SERIES WHEN USING THE CONNECTION METHOD SHOWN IN FIGURE 2.**

NOTES: UNLESS OTHERWISE SPECIFIED.

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PROJECT # 141021-2 SHEET 5 OF 7

TITLE: DU3M DU3T Devicenet Module Customer Drawing

SCALE	SIZE	DRAWING NUMBER	REVISION
1:5	B	9630-20-DU3M DU3T	10

REV.	DESCRIPTION	INITIATOR	DATE
-	See Sheet1	-	-

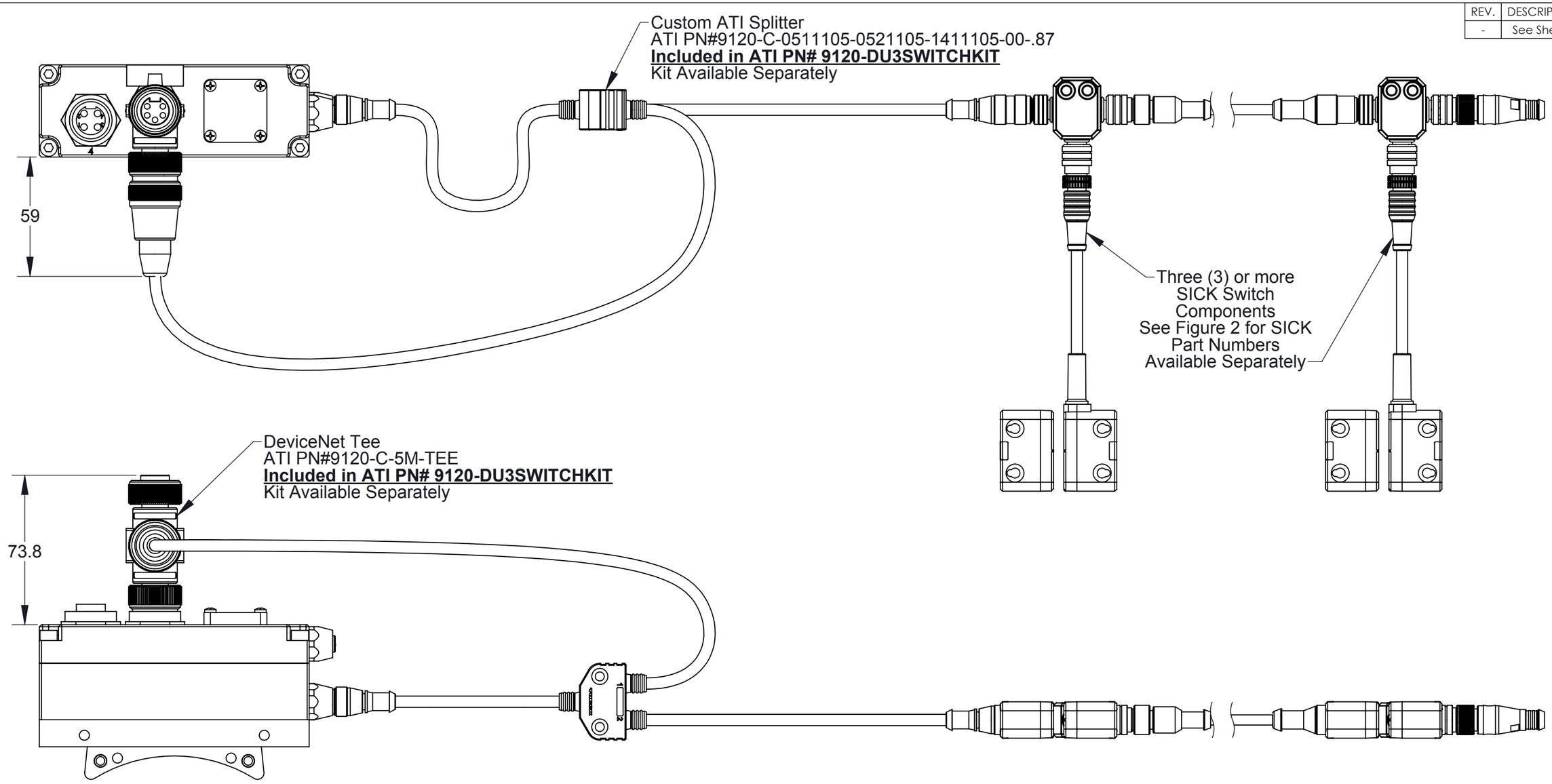


Figure 3: Connection of Three (3) or More SICK STR1 Safety Switches in Series

Series Connection of Three or More Safety Switches:

1. If three (3) or more Safety Switches are required to be connected in series then it will be necessary to combine the use of the SICK STR1 Safety Switches with the ATI 9120-DU3SWITCHKIT in the manner shown in Figure 3.

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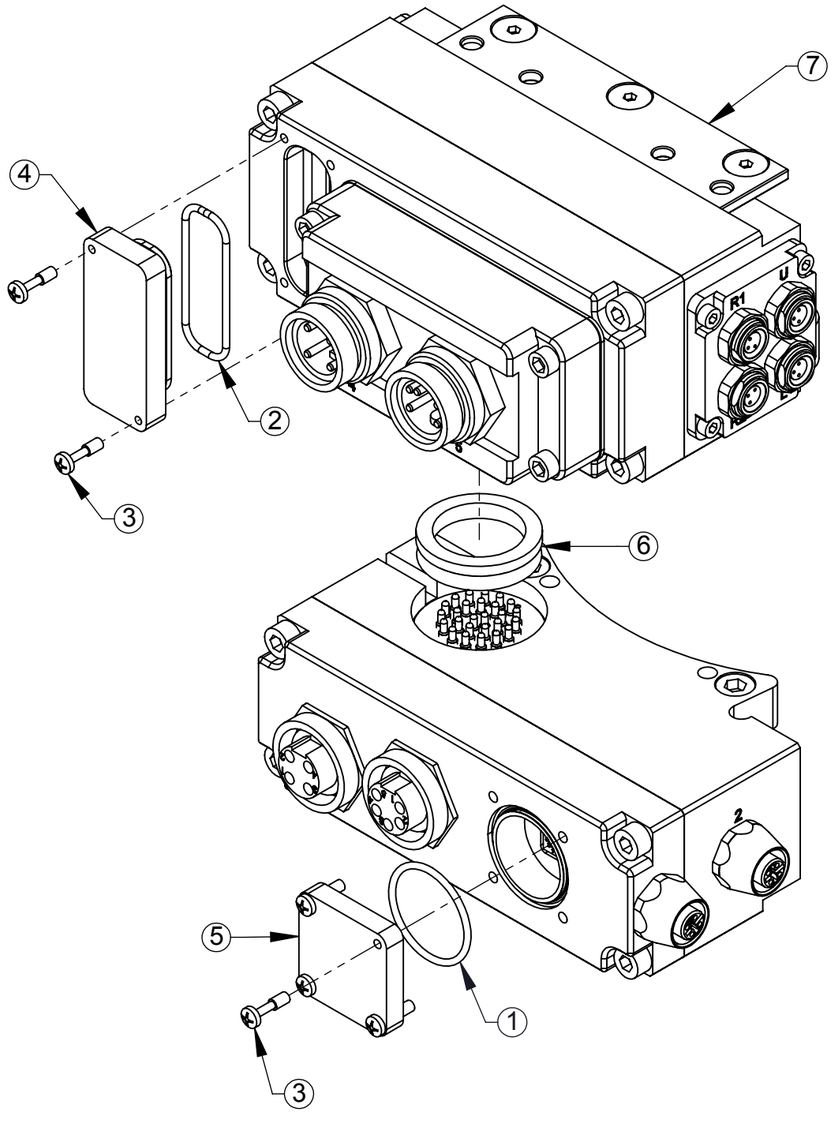
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PROJECT # 141021-2 SHEET 6 OF 7

TITLE: DU3M DU3T Devicenet Module Customer Drawing

SCALE	SIZE	DRAWING NUMBER	REVISION
1:5	B	9630-20-DU3M DU3T	10

Rev.	Description	Initiator	Date
-	See Sheet1	-	-



9121-DU3-M/T SERVICEABLE PARTS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	3410-0001008-01	Tool ID Window O-Ring
2	1	3410-0001201-01	O-Ring AS568-024
3	6	3500-9957012-21	Pan Head M3 Captive Screw M3 X 12
4	1	3700-20-2696	Device Net Master Window, Thick
5	1	3700-20-5844	Tool ID Window
6	1	4010-0000030-01	V-Ring Seal V-22A Nitrile
7	1	9005-20-1198	Master Cleat Sub-Assembly

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TITLE: DU3M DU3T Devicenet Module Customer Drawing

SCALE	SIZE	DRAWING NUMBER	REVISION
2:3	B	9630-20-DU3M DU3T	10