

How to Set Up Quick Connect

HOW TO

PURPOSE

Document provides installation instructions for Turck discrete I/O products that support "Quick Connect" feature.

QUICK CONNECT DESCRIPTION:

Quick connect is related to the process of establishing connections between a scanner and a node. It allows a scanner and a participating node to establish connection(s) and start communication as soon as node is powered AND transmits the first DupMacID message. The idea behind quick connect is to reduce amount of time required for a node to transition from off-line to on-line state by at least 1 sec. Quick connect is implemented in some automation systems that require frequent exchange of tooling. Quick Connect enables TURCK devices to become operational and online in 450msec at 125 data rate.

REQUIREMENTS:

A network may be integrated of nodes that support Quick Connect and nodes that do not have this feature. All devices that support Quick Connect, including a scanner, have to be properly set before Quick Connect is functional:

- a. For TURCK devices (refer to the list of supporting devices), it means that:
 - Quick Connect parameter is enabled (default parameter value is disabled)
 - Autobaud parameter may be disabled (recommended, default is enabled)
 - If Autobaud is disabled, Baud Rate parameter ought to be set to appropriate data rate (default is 125K)
- b. For DeviceNet scanners (refer to the list of supporting scanners), it means that:
 - appropriate scanner firmware revision is installed
 - Appropriate EDS file revision is installed

A user must make sure that following system requirements are met at all time:

- Network trunk stays intact at all time when tool sets are exchanged
- Network power is present on the trunk
- Exchanged nodes are identical and have the same node address
- All nodes that are used for exchange have quick connect feature enabled in advance
- All node addresses are unique

SUPPORTING SCANNERS

Device Type	Product	Minimum Version	EDS File Revision
Rockwell Automation	1756-DNB	4.001	Shipping
	1788-CN2DN	Major Rev. 2	TBD
	1771-SDN/C	6.004	Shipping
	1747-SDN	6.002	1.008
	1788-DNBO	2.002	Shipping
Target Device*	1734-PDN & I/O	All	Shipping
	1791D Family	Series B	Shipping
	1792D Family	Series B	Shipping
	1769-ADN	Series B v.2.003	Shipping
	1794-ADN	2.002	Shipping
Software	RSNetWorx for DeviceNet	4.01.00	Shipping

SUPPORTING DEVICES

TURCK

Device Type	Product	Firmware Revision	EDS File Revision
FDNQ-S0404G-MM		2.6 and 3.2	
FDN20	All family products	2.6 and 3.2	
FDNL-S1204H-0153		2.6 and 3.2	
FDNL-S1204H-0142		2.6 and 3.2	
FDNL, FDNP, FDNQ	Low cost stations	4.5 and 5.3	

Rockwell Automation

Device Type	Product	Minimum Version	Availability
Target Device*	1734-PDN & I/O	All	Shipping
	1791D Family	Series B	Shipping
	1792D Family	Series B	Shipping
	1769-ADN	Series B v.2.003	Shipping
	1794-ADN	2.002	Shipping

* The above list only shows selected Rockwell Automation scanner and target devices. For information on other devices not listed, please check with the appropriate manufacturers.

ENABLING QUICK CONNECT FEATURE IN A DEVICE

It is assumed that a user is familiar with Rockwell Software applications used for DeviceNet network configuration:

- RSLinx rev 2.43
- RSNetWorx 6.00.00

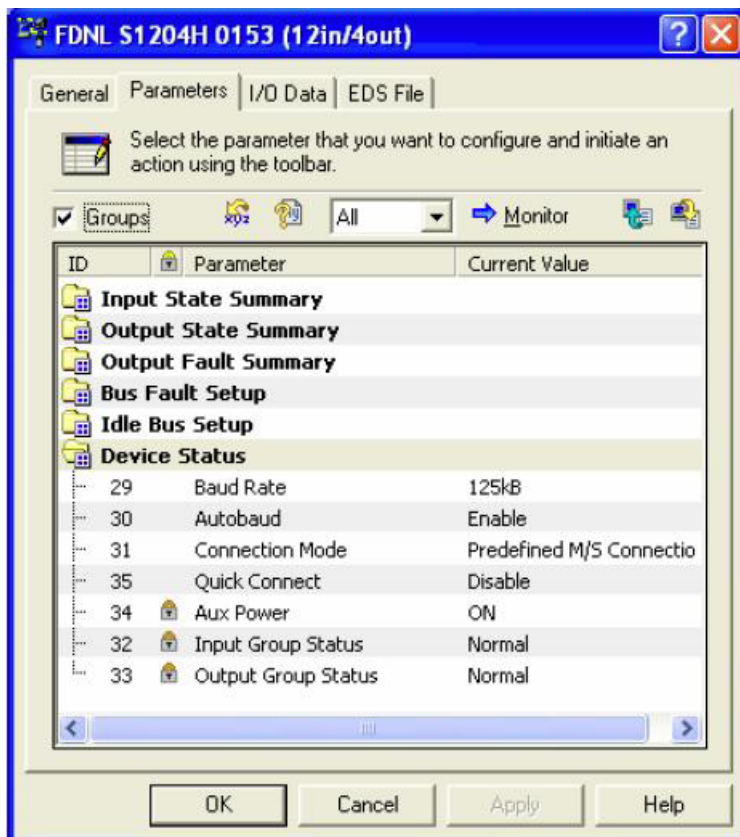
Devices are used for demonstration:

- SLC500
- FDNL-S1204G-0153

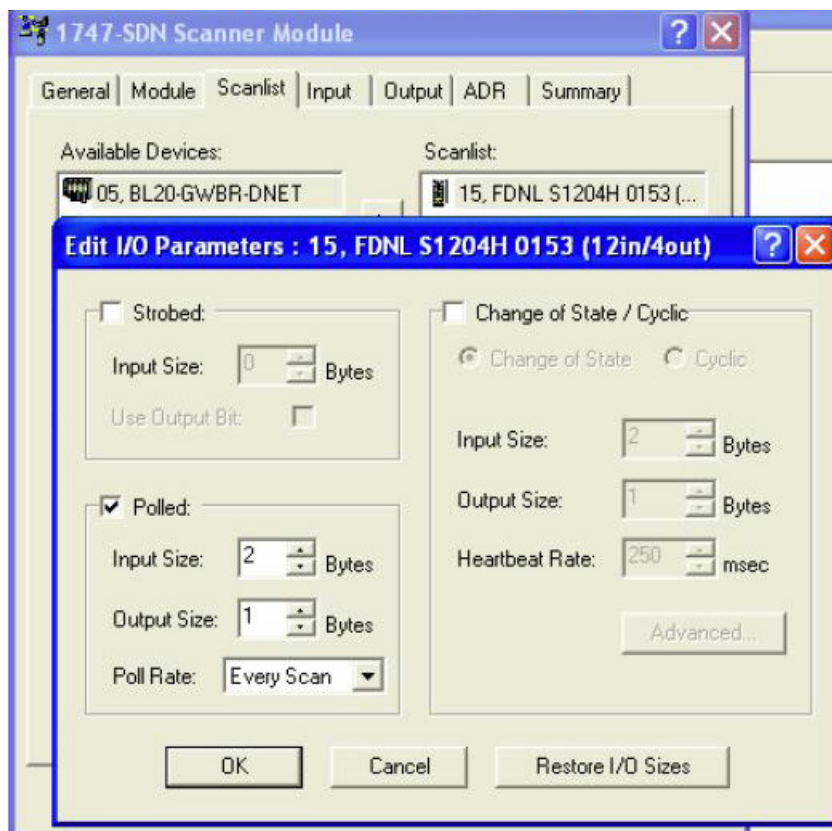
FDNP identity is as follows:

The screenshot shows a configuration window titled "FDNL S1204H 0153 (12in/4out)". The window has four tabs: "General", "Parameters", "I/O Data", and "EDS File". The "General" tab is selected. Inside the window, there is a section for "FDNL S1204H 0153 (12in/4out)" with a small icon of a device. Below this, there are fields for "Name:" (containing "FDNL S1204H 0153 (12in/4out)") and "Description:". Below the description field is an "Address:" field with a spinner set to "15". Below the address field is a "Device Identity [Primary]" section with fields for "Vendor:" (InterlinkBT LLC [256]), "Type:" (General Purpose Discrete I/O [7]), "Device:" (FDNL S1204H 0153 (12in/4out) [2449]), "Catalog:" (F0153), and "Revision:" (3.002). At the bottom of the window are four buttons: "OK", "Cancel", "Apply", and "Help".

The device communications parameters are set to default manufacturing shown on the following figure:



The device is configured in the scan list to sue default Poll connection as follows:



The time required to establish connection at FDNP power-up is 2.036 seconds captured by DeviceNet Analyzer. Message frame 2 shows the first message transmitted by FDNP (first DupMacID message). Frame 24 shows the first poll response by FDNP. Time difference between these two messages is considered as connection establishment time.

The screenshot shows the DeviceNet Traffic Analyzer interface. A table of frames is visible, with frame 2 and frame 24 highlighted. A dialog box titled 'Compute Time Difference' is open, showing the time difference between frame 2 and frame 24.

Frame #	Time	Can Id	Grp	Msg ID	Mac ID	Size	Data
1	00000000"000000	0x780	3	0x6	00	4	0F 4B 02 34
2	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
3	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
4	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
5	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
6	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
7	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
8	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
9	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
10	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
11	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
12	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
13	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
14	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
15	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
16	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
17	00000000"015175	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
18	00000002"036272	0x47B	2	0x3	15	4	00 90 4C 00
19	00000002"041890	0x47C	2	0x4	15	5	00 0E 05 02 07
20	00000002"042729	0x47B	2	0x3	15	4	00 8E 02 00
21	00000002"048948	0x47C	2	0x4	15	5	00 0E 05 02 08
22	00000002"049797	0x47B	2	0x3	15	4	00 8E 01 00
23	00000002"050949	0x47D	2	0x5	15	1	00
24	00000002"051605	0x3CF	1	0xF	15	2	00 00

Compute Time Difference

Time T1: 000018'38"781479 Frame #: 2

Time T2: 000018'40"817909 Frame #: 24

Compare Time: 000000'02"036430

Clear

Tip:
 1: Click on a frame, Drag and Drop it to the Time T1.
 2: Click on another frame then Drag and Drop it to the Time T2.

The following procedure shows Quick Connect configuration process and connection establishment timing.

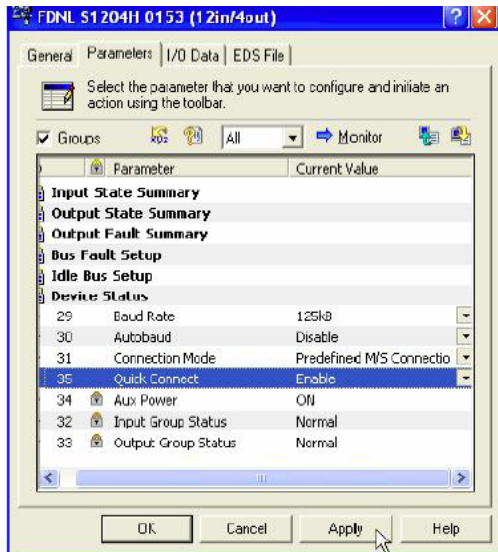
1. Disable Autobaud; press apply after selection and download selection to the device.

The screenshot shows the configuration window for FDNL S1204H 0153 (12in/4out). The 'General' tab is selected. The 'Quick Connect' parameter is set to 'Disable'.

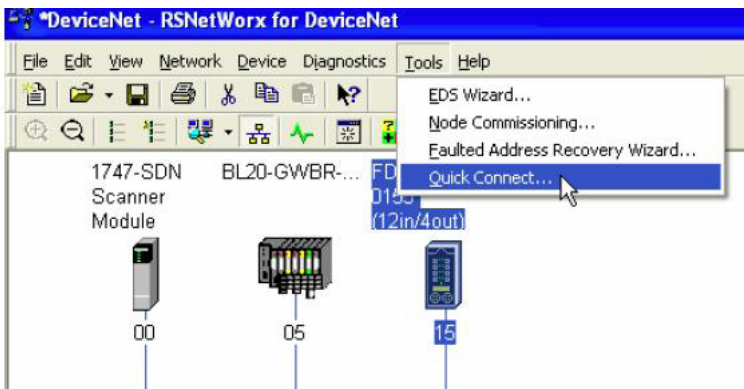
Parameter	Current Value
29 Baud Rate	125kB
30 Autobaud	Disable
31 Connection Mode	Enable
35 Quick Connect	Disable
34 Aux Power	ON
32 Input Group Status	Normal
33 Output Group Status	Normal

Buttons: OK, Cancel, Apply, Help

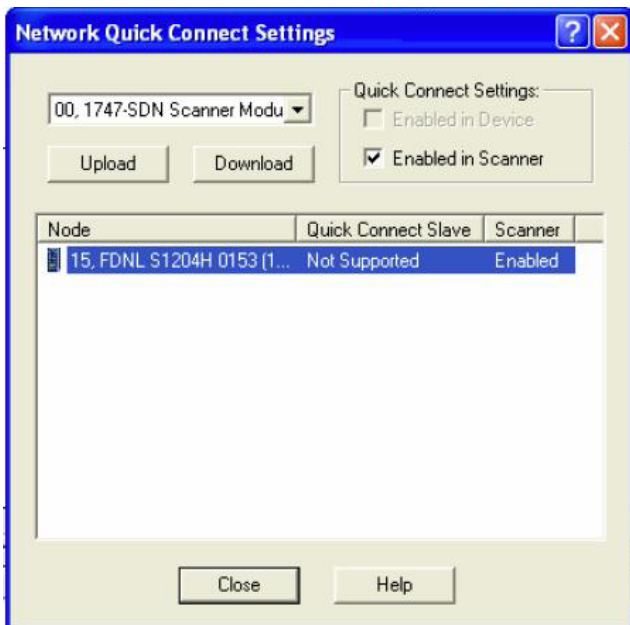
2. Enable Quick Connect: press Apply and download parameter to the device



3. Open QuickConnect function of RSNetWorx.



4. Select FDNP device and check Enable box; press download and close window.



Node 15-FDNP device is enable in the scanlist to be connected in "Quick Connect" manner although it appears that device does not support that function. Disregard that and close window. Put scanner into run mode.

Connection establishment timing, with Quick Connect enabled is 65.272msec. that is a time bewteen the Frist DupmacID message and the frist poll response.

The screenshot shows the 'DeviceNet Traffic Analyzer - [DNetTA1]' application. The main window displays a table of CAN bus traffic. A dialog box titled 'Compute Time Difference' is open, allowing the user to select two frames to compare their timestamps.

Frame #	Time	Can Id	Grp	Msg ID	Mac ID	Size	Data
1	0000000"000000	0x780	3	0x6	00	4	0F 4B 02 34
2	0000000"998157	0x780	3	0x6	00	4	0F 4B 02 34
3	0000001"998766	0x47E	2	0x6	15	6	00 4B 03 01 01 00
4	0000002"013951	0x47F	2	0x7	15	7	00 00 01 00 00 00 00
5	0000002"						02 34
6	0000002"						03 01 01 00
7	0000002"						00
8	0000002"						03 01 02 00
9	0000002"						00
10	0000002"						01 01 01
11	0000002"						00 01
12	0000002"						01 01 02
13	0000002"						07 00
14	0000002"						01 01 03
15	0000002"						91 09
16	0000002"						05 01 0C 03
17	0000002"						05 02 09 4B 00
18	0000002"						4C 00
19	0000002"						
20	0000002"063465	0x47C	2	0x4	15	5	00 0E 05 02 07
21	0000002"064305	0x47B	2	0x3	15	4	00 8E 02 00
22	0000002"070139	0x47C	2	0x4	15	5	00 0E 05 02 08
23	0000002"070989	0x47B	2	0x3	15	4	00 8E 01 00
24	0000002"078568	0x47D	2	0x5	15	1	00
25	0000002"079223	0x3CF	1	0xF	15	2	00 00

Compute Time Difference Dialog:

- Time T1: 000123'25"203788 Frame #: 4
- Time T2: 000123'25"269060 Frame #: 25
- Compare Time: 000000'00"065272
- Clear button
- Tip:
 - 1: Click on a frame, Drag and Drop it to the Time T1.
 - 2: Click on another frame then Drag and Drop it to the Time T2.

Note:

Quick Connect function depends on scanner's capabilities. The system will come up on-line as fast as the scanner can manage all connections with the slave devices. It also depends on the moment when slave device is powered and slaves node address. If the device is powered after the scanner passed that device in the scan list, it may take longer to connect the device. If node address is high, the response from device may be arbitrated by CAN messaging priority scheme.