





# **ERX150 Product Manual**

Rev 2.0 | July 2022

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1. Introduction

The ERX150 pressure monitor is a self-contained device that provides pressure readings over the LTE-M cellular network.

- Integrated pressure sensor available in a wide variety of pressure ranges.

 Configurable from MasterLink 150 (MasterLink150 software) http://www.signal-fire.com/downloads/MasterLink150/Honeywell%20MasterLink150% 20Installer%20v1.0.27.00.exe

- Cloud allows for data visualization, trending, and alarming.
- Supports MQTT Sparkplug B communication protocol for connection to other servers.
- Compact and simple to install and maintain.
- Local configuration and diagnostics available using the micro-USB port and the MasterLink 150 configuration program.

- Internal backup of a minimum of 200 datapoints in the event of loss of network signal. Backup will be automatically sent when the ERX150 reconnects to the network.

- Class 1 Division 2 certified.

### 2. Identifying the components





# 3. Network connection / LEDs

STATUS LED: The STATUS LED (green) will flash 3 times on a successful data transmission to the server.

ERROR LED: The ERROR LED (red) will blink 3 times to indicate that an attempted data transmission failed.

# 4. Force a Call Button

If the Force a Call button is pressed the ERX150 will blink the Green or Red status LED 3 times to indicate the status of the last transmission to the server.

If the Force a Call button is pressed and held for more than 1 second, the ERX150 will take readings from the attached pressure sensor and send the readings to the server.

## 5. Micro SD Slot

The MicroSD card is for future use, it is not yet implemented and should not be installed.

### 6. Powering up

The internal lithium battery pack is the default power source for the ERX150, simply plug the battery pack into the ERX150 battery connector to power the ERX150 on. Please note substitution of Honeywell ERX 150 battery may void CSA approval.

Leave ERX150 un-powered until next step.



# 6. Connecting to the ERX150

Open MasterLink 150 (no username or password required).

### You should be at the MasterLink main page (see fig 1)

Honeywell MasterLink150 v1.0.25.00		- 🗆 X
File <mark>Tools</mark> Log Help		
USB Connection USB Connection Closed USB Connection Closed Open Close Offline System Status Eirmware Unknown	Device Configuration         Main       Modem       MQTT       Sparkplug       GPS       I/O       Flow         Hardware Revision       Unknown   <	
System Uptime: Unknown Modem Status State: Unknown Registration: Unknown Network Operator: Unknown Signal Strength (RSRP): Unknown Signal Quality (RSRQ): Unknown	SF Cloud Subscription     Unknown     Report       Fast Reporting     Unknown     Battery       Relay Control     Unknown     Electror       Electronics Temperature     Unknown     Modern       Battery Voltage     Unknown     Modern       System Uptime     Unknown     DIN1 St       System UTC Time     Unknown     DIN1 Cr       System UTC Offset     Unknown     DIN1 Cr	ted Metrics     Voltage (V)     Unknown       nics Temperature (*C)     Unknown       RSRP (dBm)     Unknown       Count     Unknown       tate     Unknown       ount (cycles)     Unknown       Unknown     Unknown
MQTT Status State: Unknown Broker: Unknown Address: Unknown Power Consumption	System Local Time     Unknown     DIN1 In       Settings     DIN2 St       Node Name     DIN2 A       Report Interval (hh:mm:ss)     DIN2 In       Sensor Sample Interval     Y	Astantaneous Frequency (Hz) Unknown tate Unknown ount (cycles) Unknown verage Frequency (Hz) Unknown stantaneous Frequency (Hz) Unknown State Unknown
Average Sensor Current:     4     mA       New Battery Life Estimate:     Unknown       Average Current @ 3.3 VDC:     Unknown	System Time Settings AIN1 Network Time (NTP) Server Test	Unknown aw Unknown Update Reported Metrics
Refresh Status	Set to Defaults Refresh Apply Fig 1	Honeywell

Install Sim Card into the ERX 150.

Power up the ERX 150.

Connect the Micro USB cable to your computer and to the ERX 150

Select the proper USB port in the USB Connection Box, if no USB ports show up, hit refresh (see fig 2)





Click the open button, and the main page should populate with the info in the ERX 150 see fig 3.

Honeywell MasterLink150 v1.0.25.00		
File Settings Tools Log Help		
USB Connection	Device Configuration Main Modem MQTT	Sparkplug GPS Pressure
USB Connection Open on COM5 Open Close Offline	Hardware Revision Hardware Configuration Firmware Revision	Honeywell 150Series (v2) ERX150 v0.123-v2-3v
System Status Firmware: v0.1.23-v2-3v System Uptime: 33 days, 19:57:49	Node Name Report Interval (hh:mm:ss) SF Cloud Subscription Fast Reporting	351358816431685 20:00 Minimum Report Interval: 60 seconds Disabled
Modem Status State: Online Registration: Registered, Home Network Network Operator: Bell (302610) Grant Exercise (JEDE)	Relay Control Electronics Temperature Battery Voltage System UTC Time (Cellular)	Not Supported 23*C / 73*F 3.44 V 33 days, 19:57:49 6:222/023 17:40-30
Signal Quality (RSRQ): -10.5 dB MQTT Status	System UTC Offset (Cellular) System Local Time	) -6:00 06/22/2023 11:40:39
State:         Connected           Broker:         20.104.108.180           Address:         20.104.108.1803	Settings Node Name Report Interval (hh:mm:ss)	351358816431685 20:00
Power Consumption Average Sensor Current: 3 mA New Battery Life Estimate: 1.7 years	Sensor Sample Interval System Time Settings	5 seconds
Average Current @ 3.3 VDC: 3.763 mA	Network Time (NTP) Server	poor.ntp.org Test

Fig 3

# 7. Device Configuration

MAIN TAB

In the Device Configuration box, with the Main tab visible (see fig 5) you will need to enter in the following into settings:

Node Name – this can be found on the antenna of the ERX 150 (IMEI #), see fig 4.



Fig 4

**Report Interval** – How often you want the ERX 150 to send data to the host (hh:mm: ss). Note that the more often you send data to the host, the less battery life you will expect to get.

**Sensor Sample Interval** – This is how often the pressure transducer is going to take a snapshot of the line pressure (5, 10, 15, 30, 60 second options).



**Network Time (NTP) Server** – set with: pool.ntp.org, see fig 5. In most cases it is best to use **pool.ntp.org** to find an NTP server (or 0.pool.ntp.org, 1.pool.ntp.org, etc. if you need multiple server names). The system will try finding the closest available servers for you.

Settings		
Node Name	351358816431685	
Report Interval (hh:mm:ss)	20:00	
Sensor Sample Interval	5 seconds	~
System Time Settings		
Network Time (NTP) Server	pool.ntp.org	Test

Fig 5

### MODEM TAB

In the Device Configuration box, with the Modem tab visible you will see the following screen see fig 6.

Device	Configura	ition —			
Main	Modem	MQTT	Sparkplug	GPS	Pressure
Firmw	are Version		mfw nrf91	60 1.1.4	
IMEI			351358816	431685	
IMSI			30269050	1732737	
SIM IC	CID		89302690	1000126	35006
SIM O	perator ID		Unidentifie	d	
Opera	tor Selectio	n	Auto		
Mode	m State		Online (9 d	lays, 2:0	3:21)
Regist	ration		Registered,	Home I	Network
Netwo	ork Operato	r	Bell (30261	10)	
Tracki	ng Area Co	de (TAC)	11228		
Cell Id	lentifier (Cl)	)	54568459		
Acces	s Point Nar	ne (APN)	mnet.bell.c	a.ioe	
Radio	Access Tec	hnology	LTE-M		
Signal	Strength (F	RSRP)	-82 dBm		
Signal	Quality (R	SRQ):	-10.5 dB		
LTE-M	I Frequency	Band	B17 (700M	Hz)	
LTE-M	eDRX Cycl	e	Disabled		
LTE-M	eDRX PTW		Disabled		
Settin	gs				
Access	s Point Nan	ne (APN)	mnet.bell.c	a.ioe	
Cellula	ar Radio Mo	de	LTE-M On	ly (defau	lt)
LTE-M	/NB-loT Mo	ode	Low Laten	су	
Fallba	ck DNS Serv	/er	Not Set		

Fig 6

You will need to enter the following into settings:

Access Point Name (APN) – This will be provided by your cellular carrier. The Access Point Name (APN) defines the network path for all cellular data connectivity.



**Cellular Radio Mode** – This should be LTE-M. LTE-M is a branch of LTE technology that was built for Machine-to-Machine communication. Using LTE-M, IoT devices can transmit and receive large amounts of data without draining the battery, as is the case with <u>2G</u>, 3G and <u>4G</u> networks.

LTE-M/NB-ioT Mode – You can select Low Latency or Low Power.

NB-IoT are standardized, secure, and operator-managed in licensed spectrum. They are designed for IoT applications that are low cost, use low data rates, require long battery life, and often operate in locations that are hard to reach.

Low latency is the ability of a computing system or network to provide responses with minimal delay.

Fallback DNS Server – enter your fallback server address or leave as "Not Set" see fig 7.

Settings		
Access Point Name (APN)	mnet.bell.ca.ioe	
Cellular Radio Mode	LTE-M Only (default)	~
LTE-M/NB-IoT Mode	Low Latency	~
Fallback DNS Server	Not Set	
		_

Fig 7

**MQTT TAB** 

In the Device Configuration box, with the MQTT tab visible you will see the following screen see fig 8.

Honeywell MasterLink150 v	1.0.25.00								
File Settings Tools	Log Help								
USB Connection		Device Configurat	ion –						
Davies SN# BE001005 (CO	Show All Refresh	Main Modem	MQTT	Sparkplug G	PS	Pressure			
Device Six# RE001005 (CO	wi5) V	MQTT State		Connected (1 da	ay, 17:1	4:06)			
USB Connection Op	en on COM5	Broker Hostname		20.104.108.180					
Open Close	Offline	Broker Address		20.104.108.180	1883				
Contain Chatra		TLS Encryption (v1	.2)	Disabled					
System Status		TLS Certificate		No Certificate					
Firmware:	VU.1.23-V2-3V	Quality of Service	(QoS)	1 - At least once	•				
system optime:	55 uays, 21:15:19	Keepalive (mm:ss)		1:00					
Modem Status		Settings							
State:	Online	Cloud Service	01	50Series Cloud	🖲 Cu	stom			
Registration: Registe	ered, Home Network	Broker 1 Address	20.1	104.108.180					: 1883
Network Operator: Signal Strength (PSPD):	Bell (302610)	Broker 2 Address							-
Signal Quality (RSRO):	-9 dB	Broker 3 Address							-
		Username	CRV	VE002					
MQTT Status		Password							
State: Broker	Connected	Client ID	351	358816431685					
Address: 2	20.104.108.180:1883	Keepalive (mm:ss)	1:00	)					
Rower Concumption		TLS Settings							
Average Sensor Current:	3 mA	TLS Encryption	Dis	abled					~
New Battery Life Estimate:	1.7 years	TLS Certificate	No	Certificate					~
Average Current @ 3.3 VDC	: 3.763 mA					Manage T	S Certificates		
							co-certificates		
							_		
Refresh St	tatus	Set to Defaults						Refresh	Apply

Fig 8



You will need to enter the following into settings:

Ensure Cloud Service is set to Custom.

Broker 1 Address – this is the IP address of your main hosting site (PowerSpring, Auto Sol etc.)

Broker 2 Address – this is the IP address of your redundant hosting site (PowerSpring, Auto Sol etc.)

**Broker 3 Address** – this is the IP address of your redundant hosting site (PowerSpring, Auto Sol etc.) NOTE: If Broker 1 goes offline, the ERX 150 will try Broker 2 or Broker 3, this ensures you will keep getting critical data. You do not need to have the redundant site, just an offer for redundance sake. **Username** – This is the device name as configured in PowerSpring, Auto Sol etc.

Password - This is the device password as configured in PowerSpring, Auto Sol etc.

Client ID – This is the IMEI number found on the ERX 150 antenna (see fig 4).

**Keep Alive (mm.ss)** – This is the ERX 150 keep alive time when it cannot reach the host, best setting is 1:00

For TLS Encryption and TLS certificate, set to Disabled and No Certificate see fig 9.

Settings		
Cloud Service	○ 150Series Cloud	
Broker 1 Address	20.104.108.180 : 14	883
Broker 2 Address	:	
Broker 3 Address	:	
Username	CRWE002	
Password	•••••	
Client ID	351358816431685	
Keepalive (mm:ss)	1:00	
TLS Settings		
TLS Encryption	Disabled	~
TLS Certificate	No Certificate	~
	Manage TLS Certificates	

Fig 9



#### SPARKPLUG TAB

In the Device Configuration box, with the Sparkplug tab visible you will see the following screen see fig 10.

	sn http://www.ht	TT Contrato COC Document	
levice SN# RE001005 (COM5)	Main Modem M	211 Sparkplug GPS Pressure	
USB Connection Open on COM5	MQTT State	Connected (1 day, 17:29:21)	
0	Broker Hostname	20.104.108.180	
Open Close Omine	Broker Address	20.104.108.180:1883	
stem Status	TLS Encryption (v1.2)	Disabled	
rmware: v0.1.23-v2	-3v TLS Certificate	No Certificate	
stem Untime: 33 days 21:28	Quality of Service (Q	5) 1 - At least once	
	Keepalive (mm:ss)	1:00	
lodem Status	Settings		
ate: On	ine Cloud Service (	150Series Cloud  Custom	
gistration: Registered, Home Netw	ork Broker 1 Address	20.104.108.180	: 1883
etwork Operator: Bell (3026	10) Broker 2 Address		
anal Quality (RSRP): -65 c	dB Broker 3 Address		
gran quanty (ronq).	Usersense	79WE002	
IQTT Status	Osemanie	CAWEO02	
ate: Connec	ted Password		
roker: 20.104.108.	180 Client ID	351358816431685	
ddress: 20.104.108.180:1	883 Keepalive (mm:ss)	:00	
ower Consumption	TLS Settings		
verage Sensor Current: 3	nA TLS Encryption	Disabled	
ew Battery Life Estimate: 1.7 y	ars TLS Certificate	No Certificate	
verage Current @ 3.3 VDC: 3.763	mA		
		Manage TLS Certificat	8
verage Current @ 3.3 VDC: 3.763	ma	Manage TLS Certificat	6

Fig 10

You will need to enter the following into settings:

**Group ID** – Set to none.

Edge Node ID – Enter the ERX 150 IMEI number (found on the antenna, see fig 4).

**Require Primary Host ONLINE to Publish** – Check this box.

Primary Host ID List – Enter the MQTT host (server) name see fig 11.

Settings			
Group ID	none		Help
Edge Node ID	3513	58816431685	<u>Help</u>
Require Priman	y Host	ONLINE to Publish	<u>Help</u>
Primary Host ID	) List	FlexMQService	
Metric Write-Pr	otecti	on 🗌	
Sparkplug	MQT	T Topic & Payload Specification Rev 2.2.pdf	

Fig 11

### **GPS TAB**

In the Device Configuration box, with the GPS tab visible you will see the following screen see fig 12.



ile Settings Tools Log Help					
USB Connection Show All Refresh Device Chit PEODIODE (COMA)	Device Configuration Main Modem MQTT	Sparkplug GPS	Pressure		
USE Connection Open on COMS USE Connection Open on COMS Open COMS Open on COMS System Status Firmware V0.123-v2-3v System Uptime 33 days, 213451 Modern Status State Onione Registeror Allow Pelanok Network Operator: Registeror Home Network Network Operator: Registeror Home Network	GPS State Automatic Update Interval GPS Fix Timeout (mm:ss) Last GPS Fix Local Time Last GPS Fix Duration Last GPS Fix NMEA Data UTC Time Latitude Longitude Number of Satellites Altitude	Inactive 1 hour 5:00 03/05/2023 20:36: 4:59 Show on Google M 02:36:22 50°54'17.1°N 114°5'9.4°W 7 1021 33 m	22		Force GPS Fix
ignal Quality (RSRQ): -8.5 dB MQTT Status State: Connected	Settings Automatic Update Interval	1 hour			
Broker: 20.104.108.180 Address: 20.104.108.1803					
Verenge Sensor Current: 3 mA New Battery Life Estimate: 1.7 years Average Current @ 3.3 VDC: 3.763 mA					
Refresh Status	Set to Defaults			Refresh	Apply

Leave the GPS as inactive, as turning GPS on, will drain the battery much quicker. Typically, the ERX 150 will be installed and left at a stationary location, so there is no need for GPS.

#### PRESSURE TAB

In the Device Configuration box, with the Pressure tab visible you will see the following screen see fig 13.

Show All Refresh	Main Modem MOTT	Searcholus GDC Pressure	
Device SN# RE001005 (COM5)	Settings	aparkprog or s	
USB Connection Open on COM5	Pressure Sensor Span (nsi)	0 - 100 osi	
Open Close Offline	Pressure Scale Units	psi	
System Status	Scale Low Value	0	
Firmware: v0.1.23-v2-3v	Scale High Value	100	
System Uptime: 33 days, 21:37:12	Scale Units	psi	
Modem Status	Scale Adjustment +/-	0	ps
State: Online	Specific Gravity (Liquids)	1.0	
Registration: Registered, Home Network			Calibrate Sensor Zero Sensor
Network Operator: Bell (302610)	Pressure Sample Interval	5 seconds	· · · · · · · · · · · · · · · · · · ·
Signal Strength (RSRP): -85 dBm Signal Quality (RSRO): -8.5 dB	Low Alarm Enabled	Disabled	
agna quany (rang)	Low Alarm Threshold	-1	ps
MQTT Status	High Alarm Enabled	Disabled	
Broker: 20.104.108.180	High Alarm Threshold	85	ps
Address: 20.104.108.180:1883	Pressure Samples this Repo	t Interval	Sample Pressure Sensor
Power Consumption	Last Sample	18.366 psi	Sumpre l'ressure sensor
Average Sensor Current: 3 mA	Minimum Sample	18.337 psi	
New Battery Life Estimate: 1.7 years	Maximum Sample	18.373 psi	
Average Current @ 3.3 VDC: 3.763 mA	Sample Average	18.351 psi	

Fig 13

You will need to enter the following into settings:



**Pressure Scale Units** – Use the drop down to select the unit of measure for the pressure output (PSI, Kpa, Bar).

**Pressure Sample Interval** – Use the drop down to select the pressure sample rate from 5 seconds to 60 seconds. Faster sample rates will use more battery power.

**Low Alarm Enabled** – Keep enabled if you wish to get low-pressure alarms, otherwise disable by checking the disabled box.

Low Alarm Threshold – You set what the low-pressure alarm value should be.

**High Alarm Enabled** – Keep enabled if you wish to get high-pressure alarms, otherwise disable by checking the disabled box.

High Alarm Threshold – You set what the high-pressure alarm value should be.

### System Status

The system status will show you the current firmware version of the ERX 150, as well as how long it has been connected to the network, see fig 14.

Firmware:	v0.1.23-v2-3v
System Uptime:	33 days, 22:21:22

Fig 14

Modem Status

This will show you valuable information regarding your network connection see fig 15.

- Modem Status	
State:	Online
Registration:	Registered, Home Network
Network Operator:	Bell (302610)
Signal Strength (RS	RP): -84 dBm
Signal Quality (RSR	Q): -9.5 dB

Fig 15



### **MQTT Status**

Here you will see if you are connected to a broker, which broker and address of broker see fig 16.

MQTT Status	
State:	Connected
Broker:	20.104.108.180
Address:	20.104.108.180:1883

Fig 16

### **Power Consumption**

Here you can see information for the ERX 150 battery. This is a valuable tool when selecting sample rates, GPS etc., as it lets you know how any changes you make affect the battery life of the ERX 150 see fig 17.

Average Sensor Current:	3 mA
New Battery Life Estimate:	1.7 years
Average Current @ 3.3 VDC:	3.763 mA

Insert 11 – Mounting and care & 12 – Lithium battery replacement.